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Clark

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(54) **SYSTEMS AND METHODS FOR COMMUNICATING WITH A DEVICE USING ONE OR MORE CAMERA BODY CONTROLS**

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Related U.S. Application Data

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(51) **Int. Cl.**
G03B 15/02 (2006.01)
G03B 15/05 (2006.01)

(52) **U.S. Cl.** **396/56**; 396/4; 396/164; 396/299

(58) **Field of Classification Search** 396/1–5, 396/56–58, 166, 175, 201, 280, 299, 301–303; 348/333.13

See application file for complete search history.

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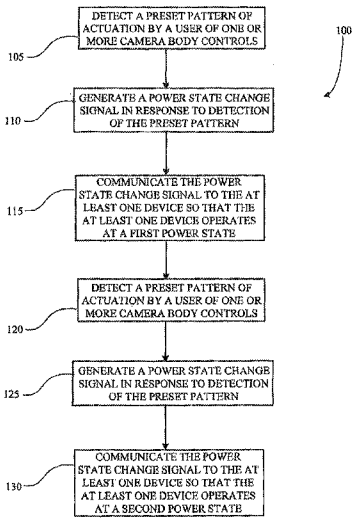
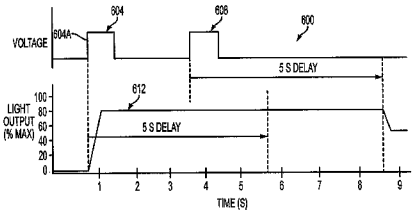
(57) **ABSTRACT**

A control system for communicating with a controlled device, such as a lighting device, a special effects device and an in-scene device, in a photographic image-acquisition setting using a camera body. The control system is configured to detect a preset pattern of actuation of one or more camera body controls by a user. In response to detecting of the preset pattern, the control system either communicates a power state change signal to the controlled device or causes the camera body to enter into a controlled device control mode that changes the functionality of one or more camera body controls from a camera body functionality to a controlled device control functionality, or both. Such a system can allow a photographer to control a controlled device while remaining at the camera body.

46 Claims, 13 Drawing Sheets


DETECT A PRESET PATTERN OF ACTUATION BY A USER OF ONE OR MORE CAMERA BODY CONTROLS
105
100
GENERATE A POWER STATE CHANGE SIGNAL IN RESPONSE TO DETECTION OF THE PRESET PATTERN
110
COMMUNICATE THE POWER STATE CHANGE SIGNAL TO THE AT LEAST ONE DEVICE SO THAT THE AT LEAST ONE DEVICE OPERATES AT A FIRST POWER STATE
115
DETECT A PRESET PATTERN OF ACTUATION BY A USER OF ONE OR MORE CAMERA BODY CONTROLS
120
GENERATE A POWER STATE CHANGE SIGNAL IN RESPONSE TO DETECTION OF THE PRESET PATTERN
125
COMMUNICATE THE POWER STATE CHANGE SIGNAL TO THE AT LEAST ONE DEVICE SO THAT THE AT LEAST ONE DEVICE OPERATES AT A SECOND POWER STATE
130



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U.S. Appl. No. 12/104,950, filed Apr. 17, 2008, now U.S. Pat. No. 7,764,875.
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U.S. Appl. No. 13/399,333, filed Feb. 17, 2012.
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U.S. Appl. No. 11/697,241, filed Apr. 5, 2007, now U.S. Pat. No. 7,437,063.
U.S. Appl. No. 12/250,914, filed Oct. 14, 2008, now U.S. Pat. No. 7,702,228.
U.S. Appl. No. 12/762,811, filed Apr. 19, 2010, now U.S. Pat. No. 7,970,267.
U.S. Appl. No. 13/169,413, filed Jun. 27, 2011, now U.S. Pat. No. 8,180,210.
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U.S. Appl. No. 12/129,447, filed May 29, 2008, now U.S. Pat. No. 7,775,575.
U.S. Appl. No. 12/129,402, filed May 29, 2008, now U.S. Pat. No. 7,783,188.
U.S. Appl. No. 12/861,445, filed Aug. 23, 2010, now U.S. Pat. No. 7,885,533.
U.S. Appl. No. 13/021,951, filed Feb. 7, 2011.
U.S. Appl. No. 13/253,596, filed Oct. 5, 2011.
U.S. Appl. No. 13/201,182, filed Aug. 11, 2011.
U.S. Appl. No. 13/201,185, filed Aug. 11, 2011.
U.S. Appl. No. 13/201,281, filed Aug. 12, 2011.
U.S. Appl. No. 13/208,686, filed Aug. 12, 2011.
U.S. Appl. No. 13/208,706, filed Aug. 12, 2011.
U.S. Appl. No. 13/401,175, filed Feb. 21, 2012.
U.S. Appl. No. 12/705,052, filed Feb. 12, 2010.
U.S. Appl. No. 12/705,096, filed Feb. 12, 2010.
U.S. Appl. No. 12/705,164, filed Feb. 12, 2010.

* cited by examiner

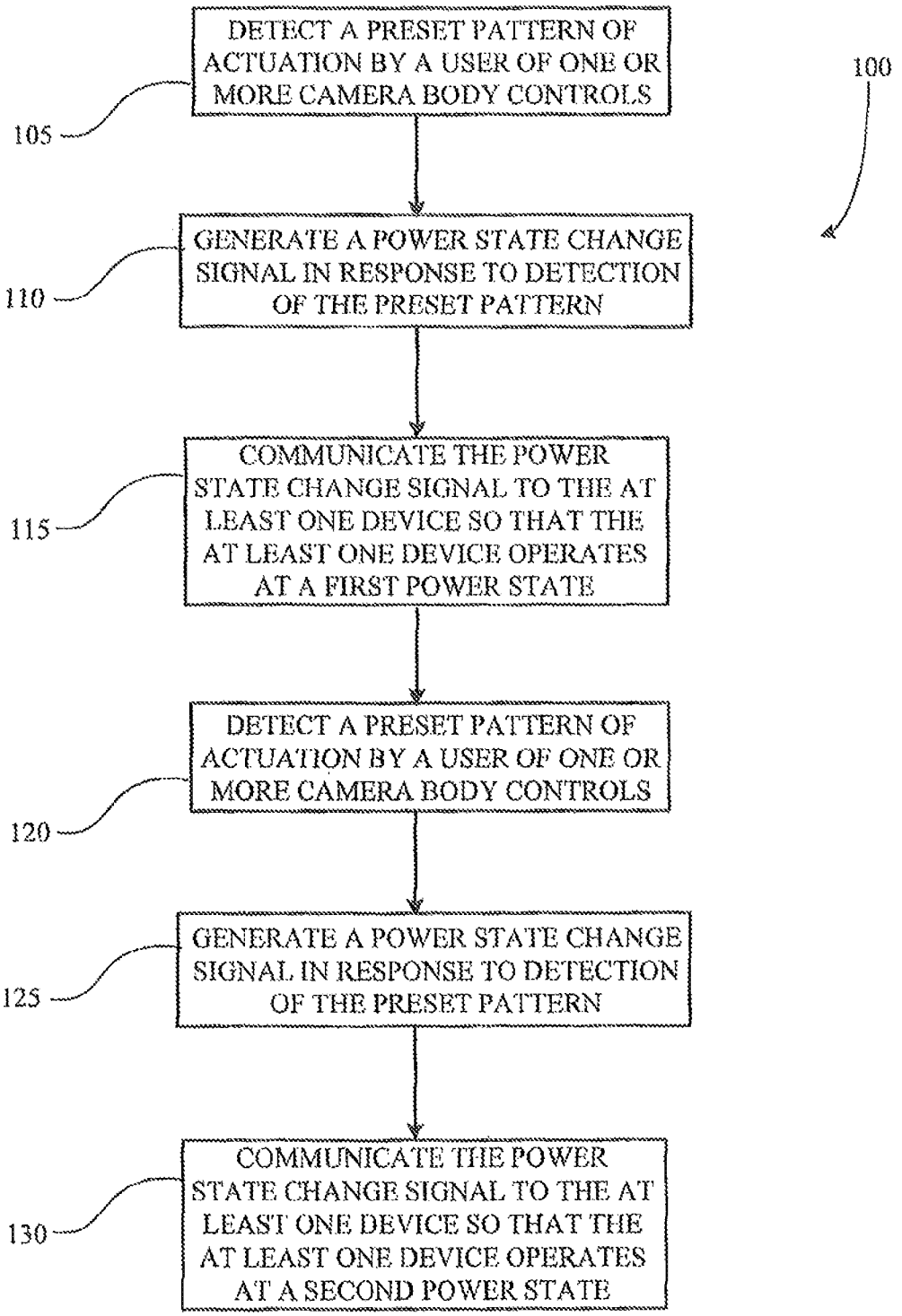
DETECT A PRESET PATTERN OF ACTUATION BY A USER OF ONE OR MORE CAMERA BODY CONTROLS
105
100
GENERATE A POWER STATE CHANGE SIGNAL IN RESPONSE TO DETECTION OF THE PRESET PATTERN
110
COMMUNICATE THE POWER STATE CHANGE SIGNAL TO THE AT LEAST ONE DEVICE SO THAT THE AT LEAST ONE DEVICE OPERATES AT A FIRST POWER STATE
115
DETECT A PRESET PATTERN OF ACTUATION BY A USER OF ONE OR MORE CAMERA BODY CONTROLS
120
GENERATE A POWER STATE CHANGE SIGNAL IN RESPONSE TO DETECTION OF THE PRESET PATTERN
125
COMMUNICATE THE POWER STATE CHANGE SIGNAL TO THE AT LEAST ONE DEVICE SO THAT THE AT LEAST ONE DEVICE OPERATES AT A SECOND POWER STATE
130

FIG. 1A

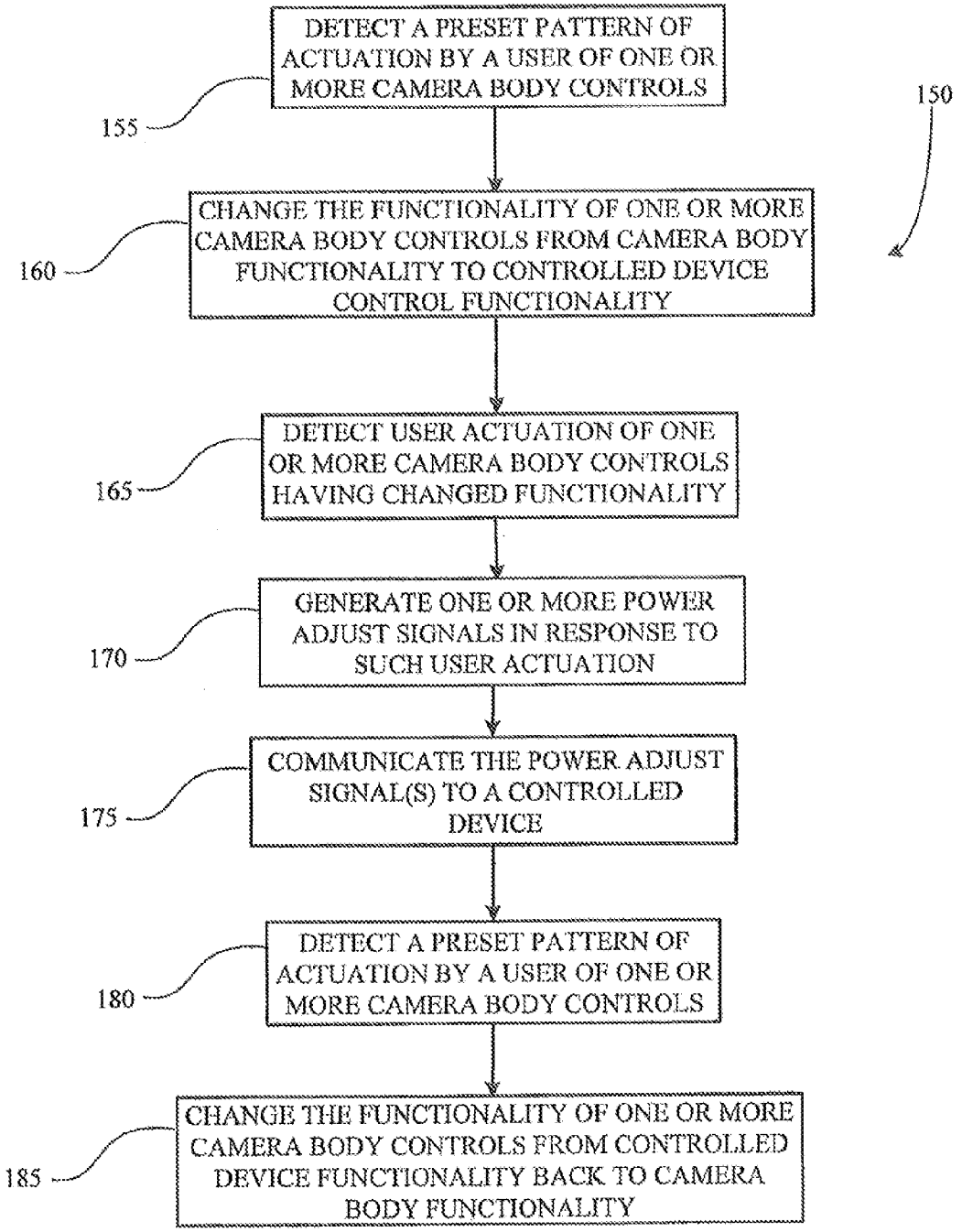
DETECT A PRESET PATTERN OF ACTUATION BY A USER OF ONE OR MORE CAMERA BODY CONTROLS
155
150
CHANGE THE FUNCTIONALITY OF ONE OR MORE CAMERA BODY CONTROLS FROM CAMERA BODY FUNCTIONALITY TO CONTROLLED DEVICE CONTROL FUNCTIONALITY
160
DETECT USER ACTUATION OF ONE OR MORE CAMERA BODY CONTROLS HAVING CHANGED FUNCTIONALITY
165
GENERATE ONE OR MORE POWER ADJUST SIGNALS IN RESPONSE TO SUCH USER ACTUATION
170
COMMUNICATE THE POWER ADJUST SIGNAL(S) TO A CONTROLLED DEVICE
175
DETECT A PRESET PATTERN OF ACTUATION BY A USER OF ONE OR MORE CAMERA BODY CONTROLS
180
CHANGE THE FUNCTIONALITY OF ONE OR MORE CAMERA BODY CONTROLS FROM CONTROLLED DEVICE FUNCTIONALITY BACK TO CAMERA BODY FUNCTIONALITY
185

FIG. 1B

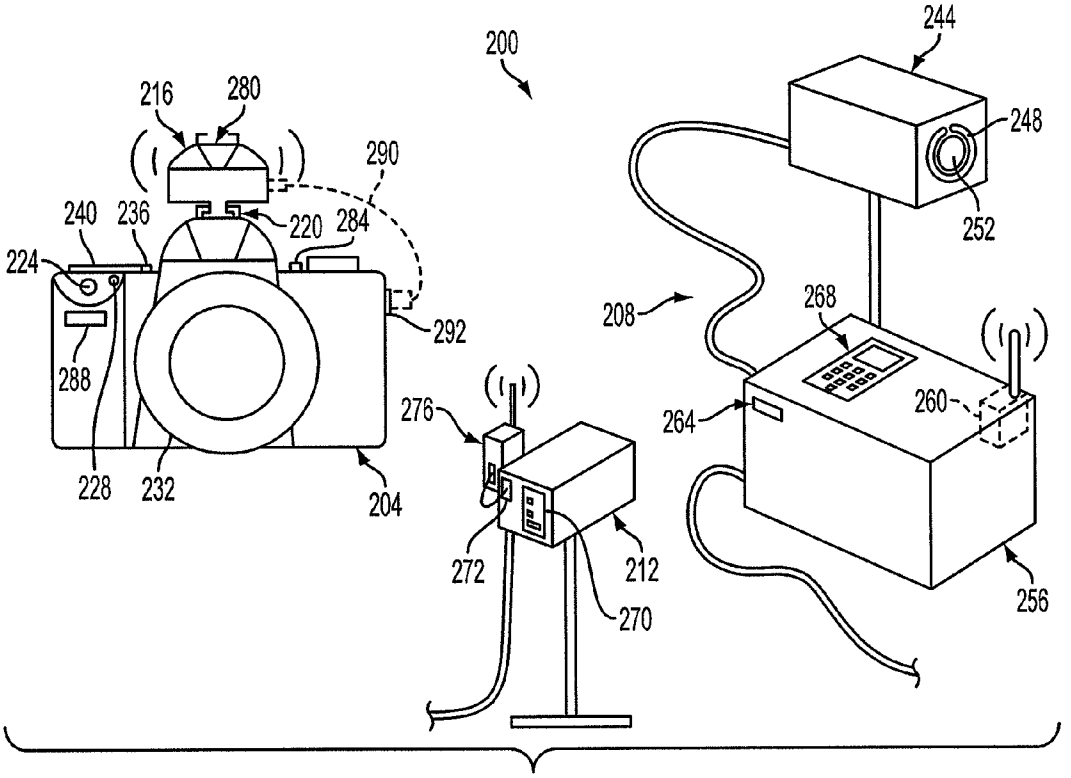
200
216
280
290
240
236
220
284
224
292
288
228
232
204
276
272
212
270
244
248
252
208
268
264
260
256

FIG. 2

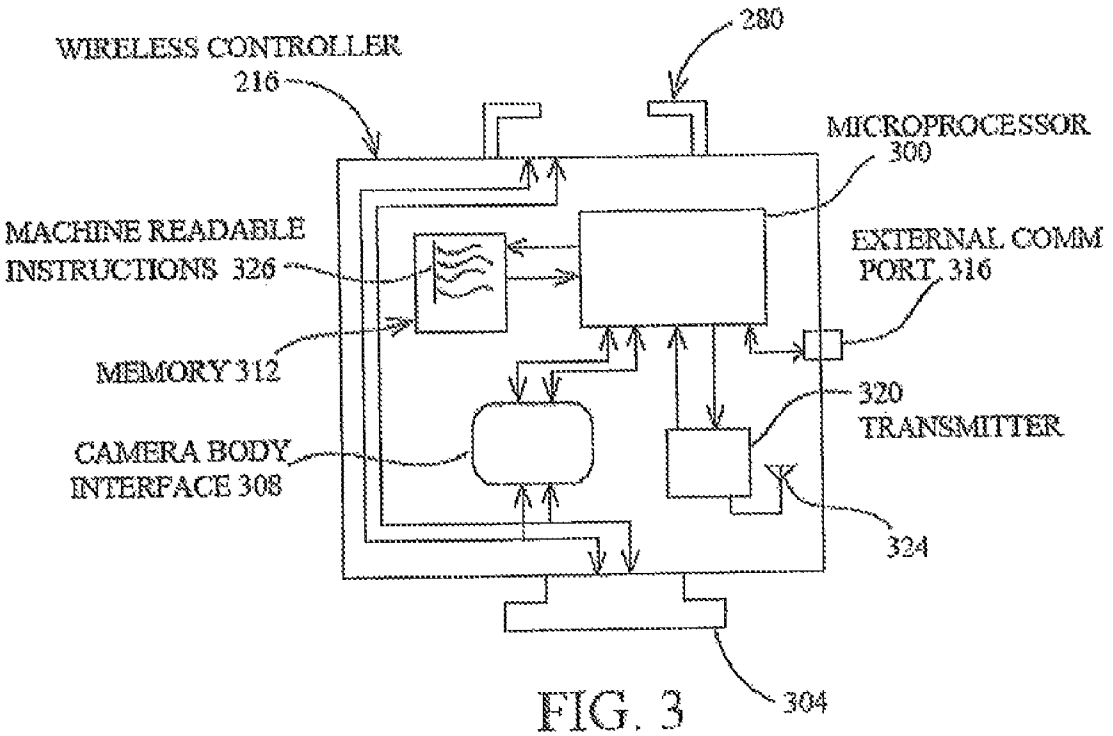
WIRELESS CONTROLLER
216
280
MICROPROCESSOR
300
MACHINE READABLE
INSTRUCTIONS 326
EXTERNAL COMM
PORT 316
MEMORY 312
320
TRANSMITTER
CAMERA BODY
INTERFACE 308
324
304

FIG. 3

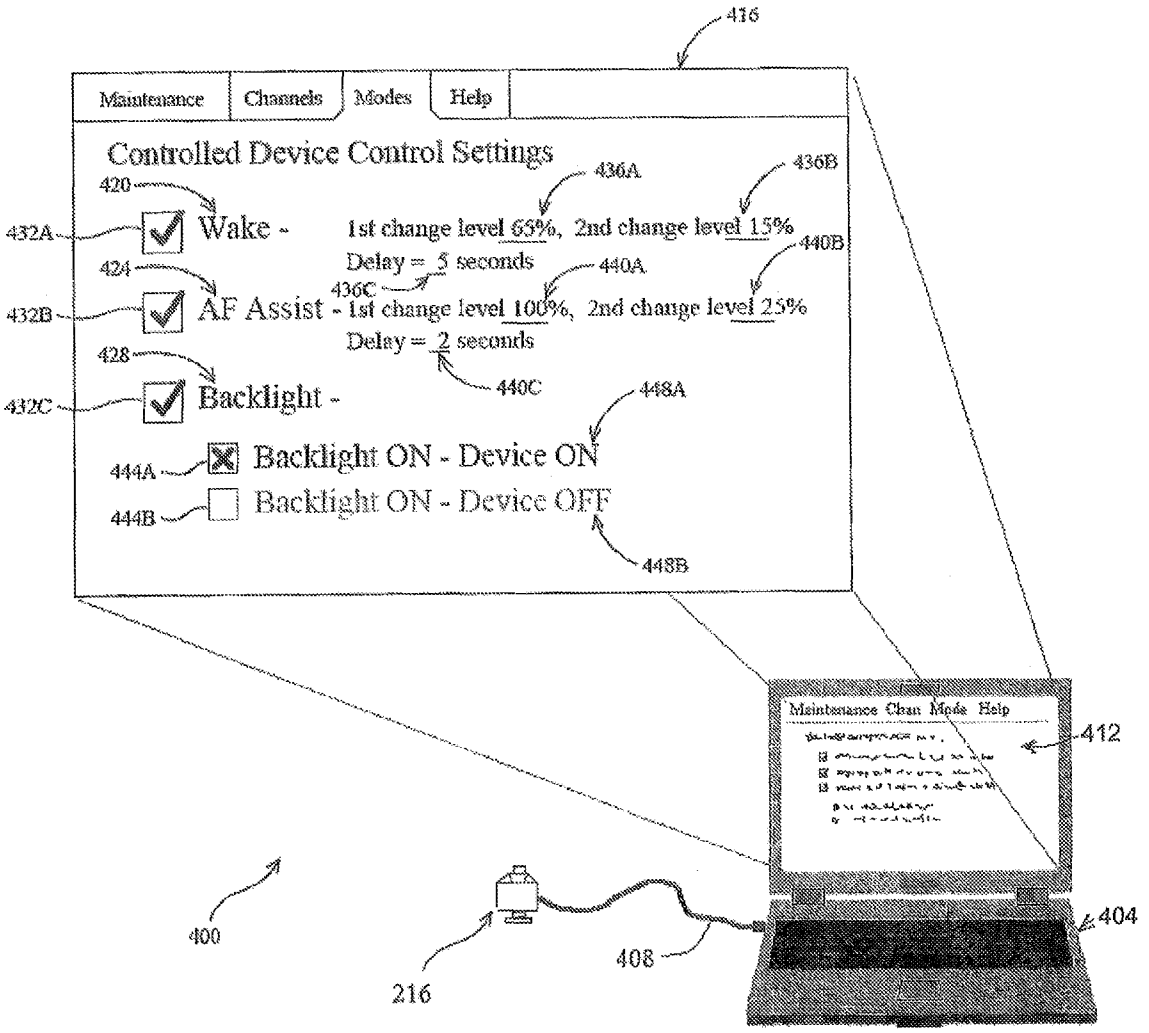
416
Maintenance
Channels
Modes
Help
Controlled Device Control Settings
420
436A
436B
Wake -
1st change level 65%, 2nd change level 15%
432A
Delay = 5 seconds
424
436C
440A
440B
AF Assist - 1st change level 100%, 2nd change level 25%
432B
Delay = 2 seconds
428
440C
Backlight -
448A
432C
444A
Backlight ON - Device ON
444B
Backlight ON - Device OFF
448B
412
404
400
216
408

FIG. 4

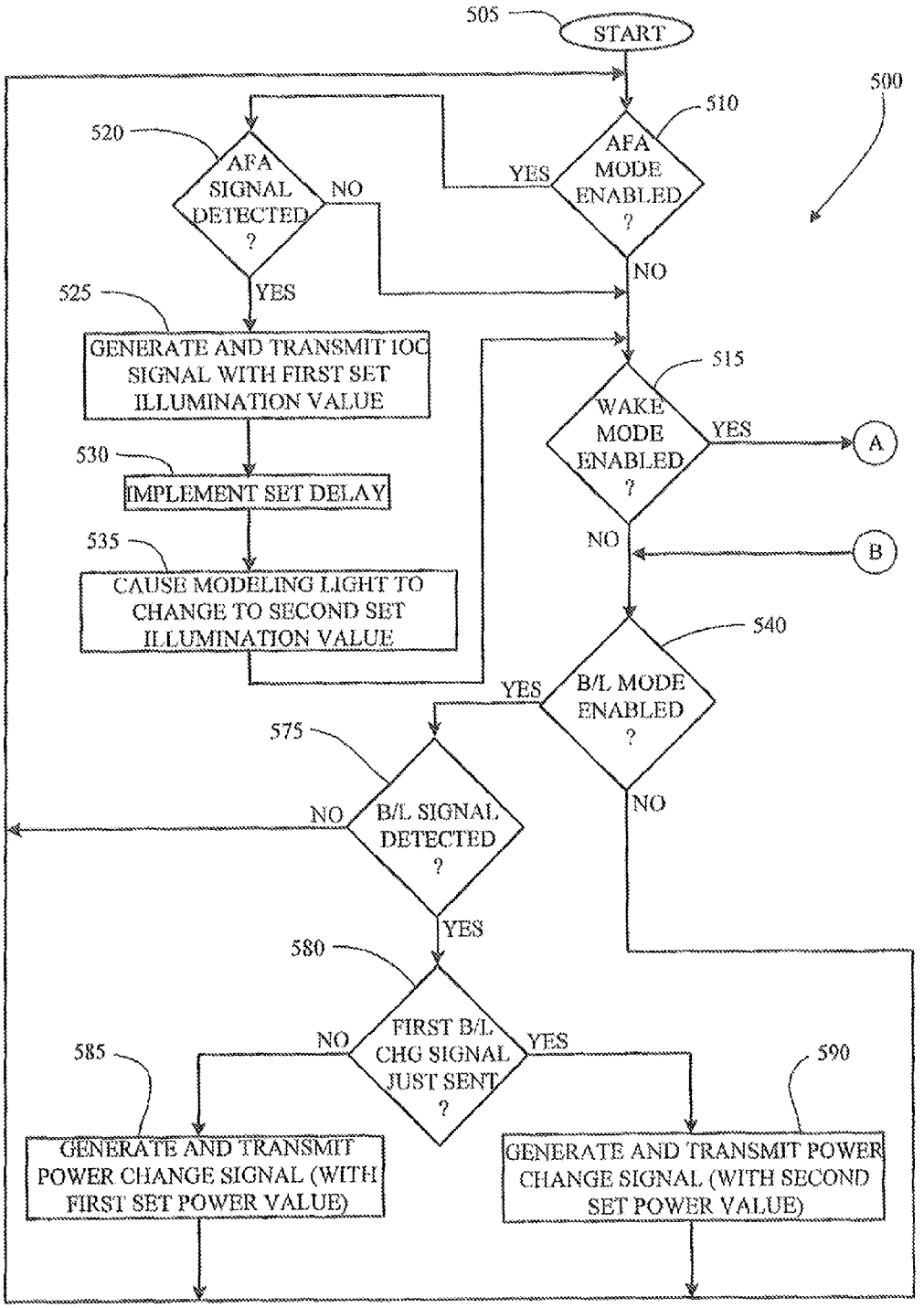
505
START
500
510
AFA MODE ENABLED ?
YES
NO
520
AFA SIGNAL DETECTED ?
NO
YES
525
GENERATE AND TRANSMIT IOC SIGNAL WITH FIRST SET ILLUMINATION VALUE
530
IMPLEMENT SET DELAY
535
CAUSE MODELING LIGHT TO CHANGE TO SECOND SET ILLUMINATION VALUE
515
WAKE MODE ENABLED ?
YES
A
NO
B
540
B/L MODE ENABLED ?
YES
NO
575
B/L SIGNAL DETECTED ?
NO
YES
580
FIRST B/L CHG SIGNAL JUST SENT ?
NO
YES
585
590
GENERATE AND TRANSMIT POWER CHANGE SIGNAL (WITH FIRST SET POWER VALUE)
GENERATE AND TRANSMIT POWER CHANGE SIGNAL (WITH SECOND SET POWER VALUE)

FIG. 5A

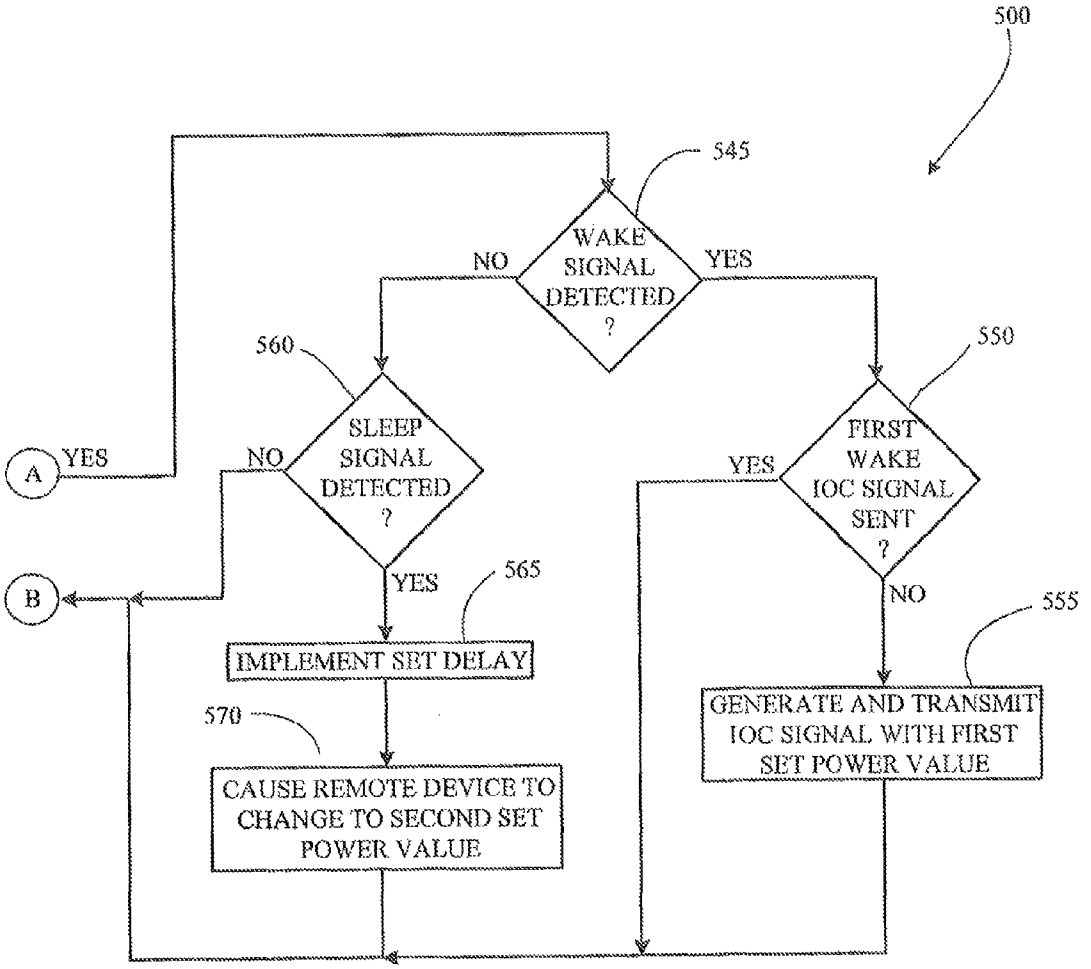
500
545
WAKE SIGNAL DETECTED ?
NO
YES
560
SLEEP SIGNAL DETECTED ?
550
FIRST WAKE IOC SIGNAL SENT ?
A
YES
NO
YES
B
YES
NO
565
555
IMPLEMENT SET DELAY
570
CAUSE REMOTE DEVICE TO CHANGE TO SECOND SET POWER VALUE
GENERATE AND TRANSMIT IOC SIGNAL WITH FIRST SET POWER VALUE

FIG. 5B

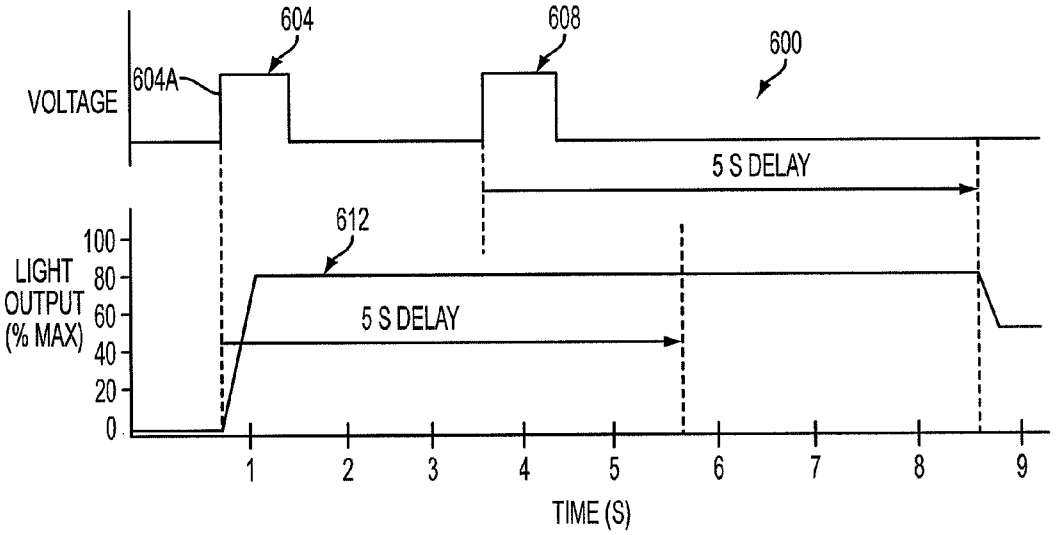
604
608
600
VOLTAGE
604A
5 S DELAY
612
LIGHT OUTPUT (% MAX)
100
80
60
40
20
0
5 S DELAY
1
2
3
4
5
6
7
8
9
TIME (S)

FIG. 6

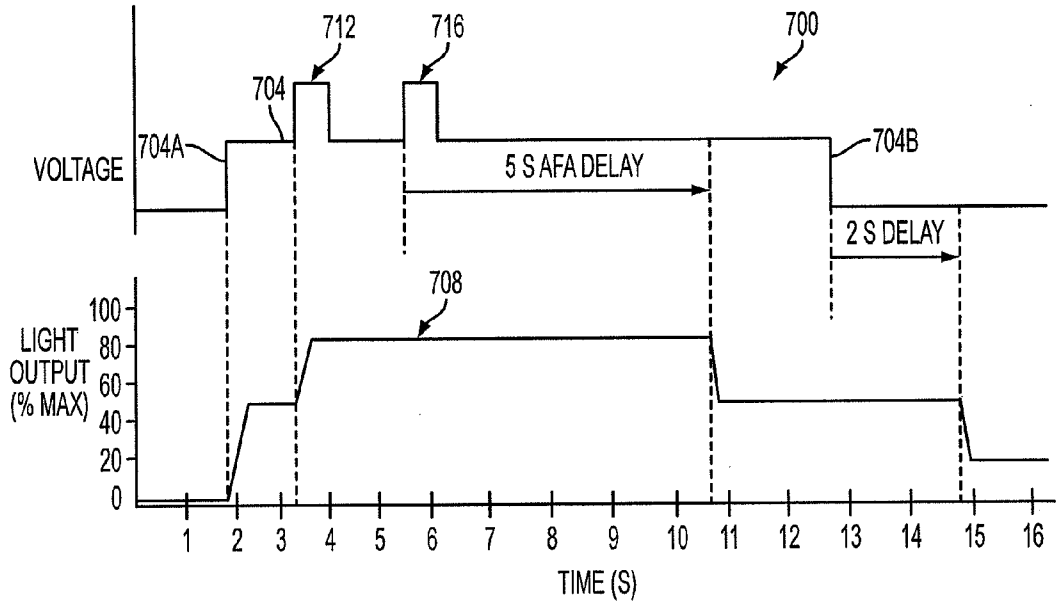
712
716
700
704
VOLTAGE
704A
704B
5 S AFA DELAY
2 S DELAY
708
LIGHT OUTPUT (% MAX)
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
TIME (S)

FIG. 7

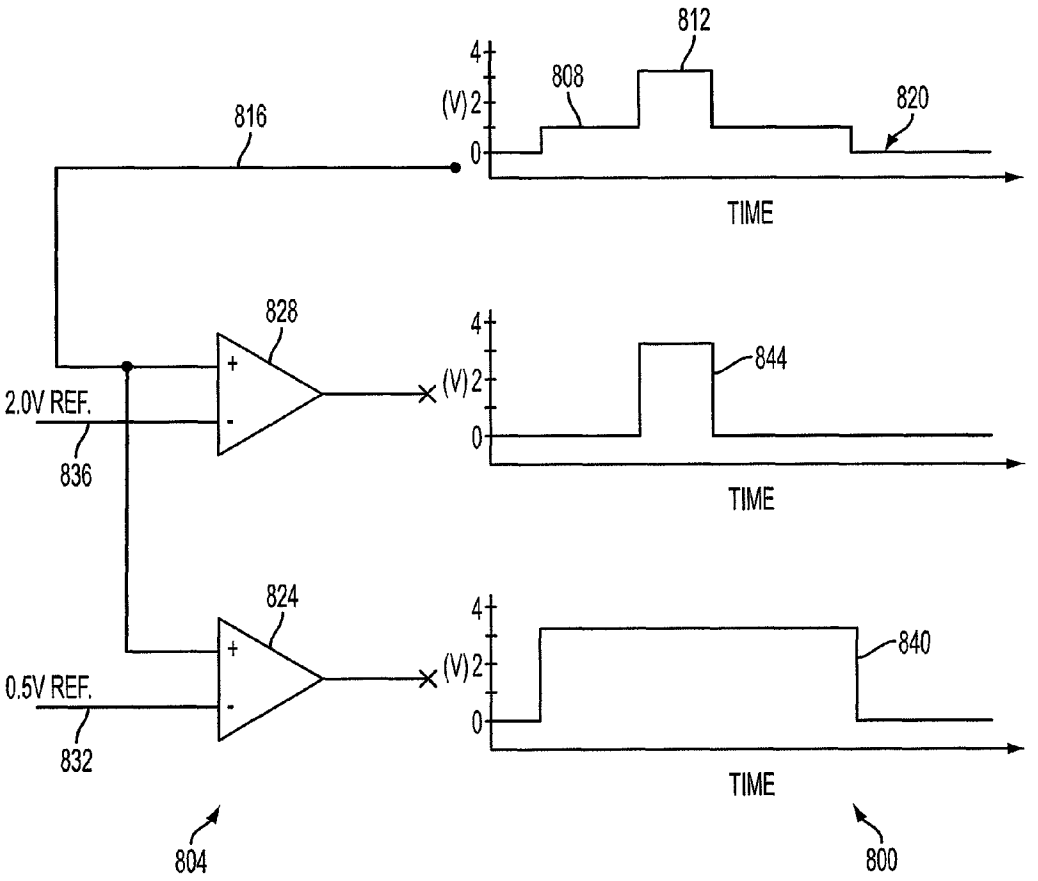
812
808
820
816
4
(V) 2
0
TIME
828
844
2.0V REF.
836
824
840
0.5V REF.
832
804
800

FIG. 8

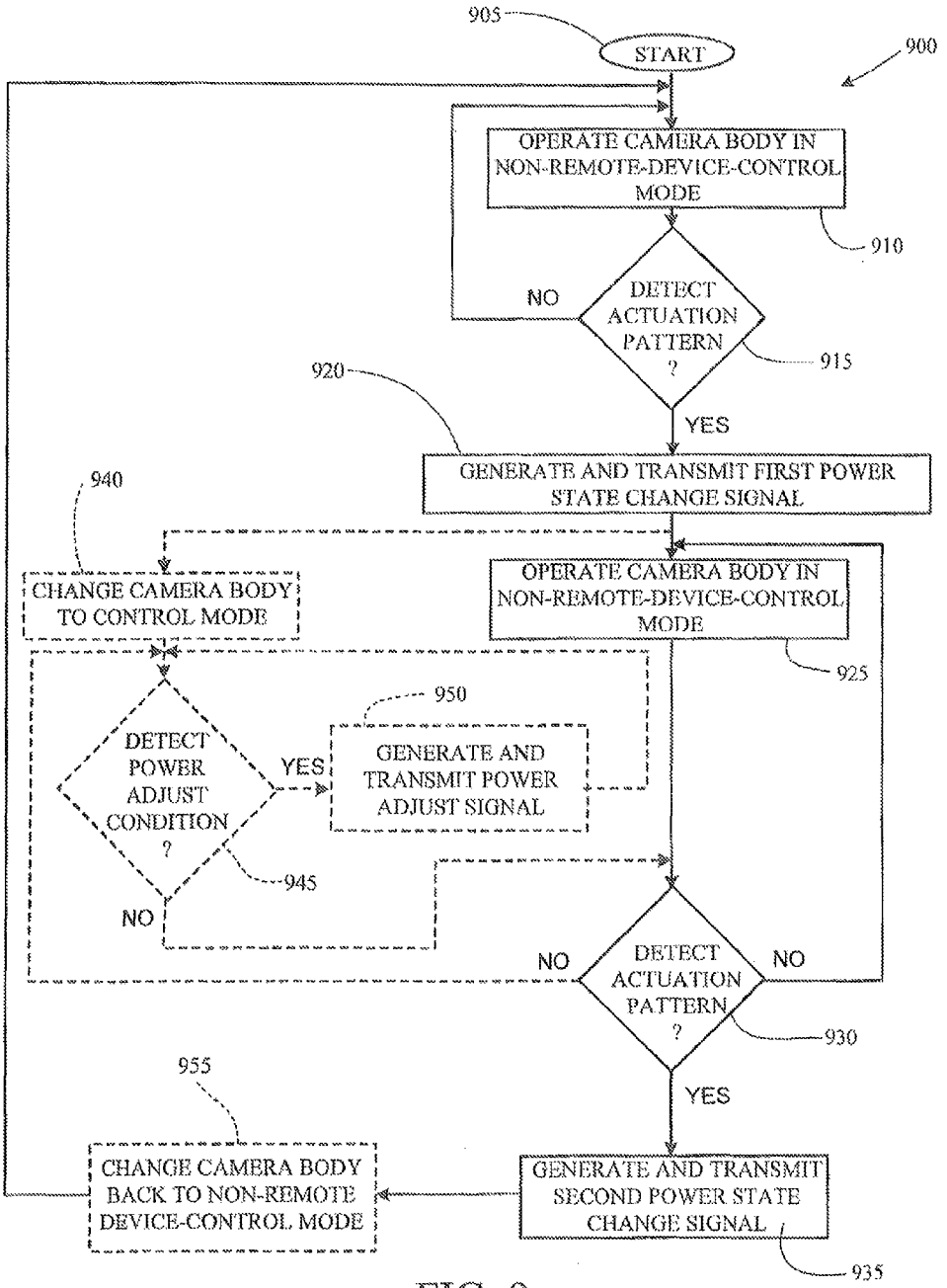
905
START
900
OPERATE CAMERA BODY IN NON-REMOTE-DEVICE-CONTROL MODE
910
NO
DETECT ACTUATION PATTERN ?
915
920
YES
GENERATE AND TRANSMIT FIRST POWER STATE CHANGE SIGNAL
940
CHANGE CAMERA BODY TO CONTROL MODE
OPERATE CAMERA BODY IN NON-REMOTE-DEVICE-CONTROL MODE
925
950
DETECT POWER ADJUST CONDITION ?
YES
GENERATE AND TRANSMIT POWER ADJUST SIGNAL
945
NO
NO
DETECT ACTUATION PATTERN ?
NO
930
955
YES
CHANGE CAMERA BODY BACK TO NON-REMOTE DEVICE-CONTROL MODE
GENERATE AND TRANSMIT SECOND POWER STATE CHANGE SIGNAL
935

FIG. 9

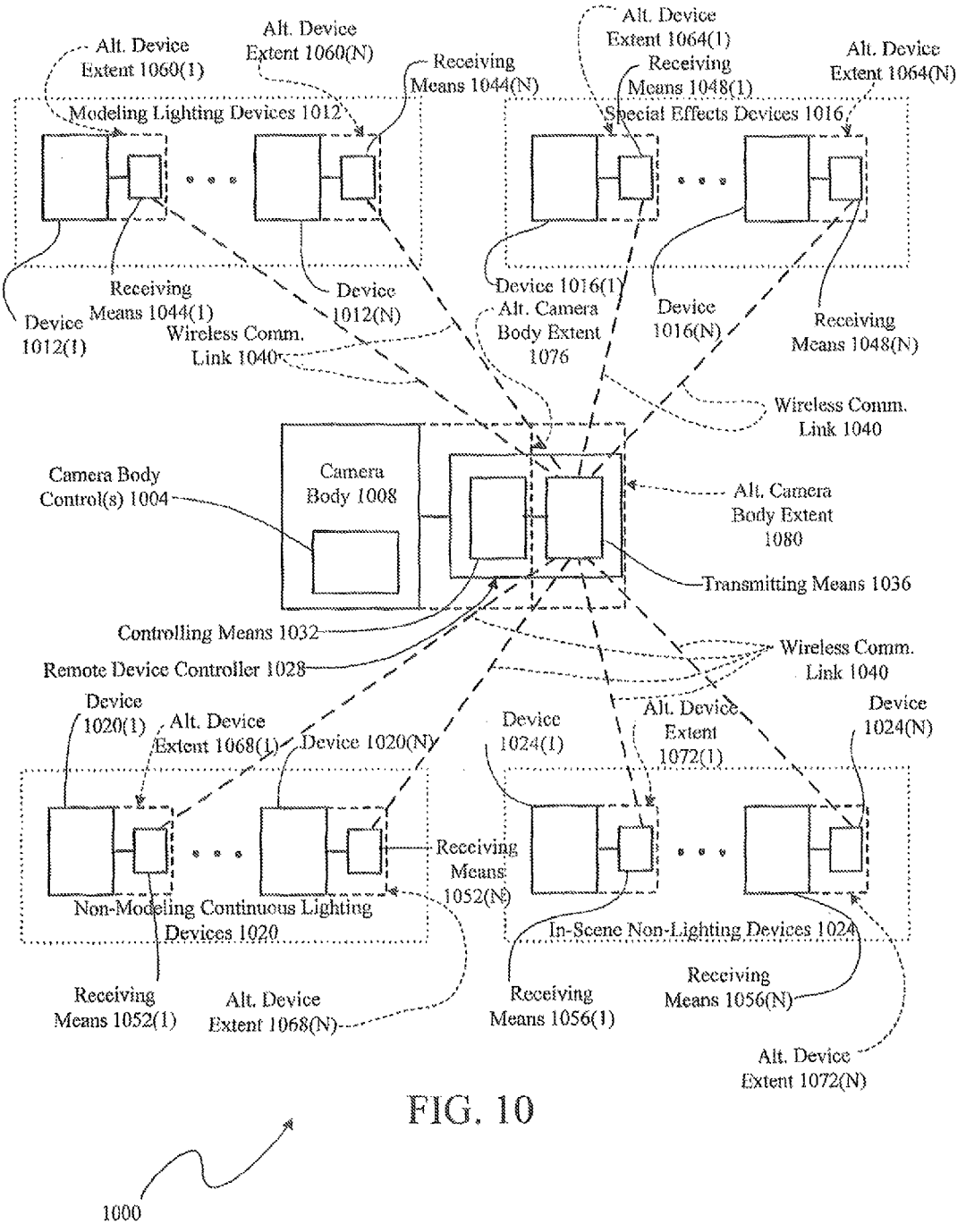
Alt. Device Extent 1060(1)
Alt. Device Extent 1060(N)
Receiving Means 1044(N)
Alt. Device Extent 1064(1)
Receiving Means 1048(1)
Alt. Device Extent 1064(N)
Modeling Lighting Devices 1012
Special Effects Devices 1016
Receiving Means 1044(1)
Device 1012(1)
Wireless Comm. Link 1040
Device 1012(N)
Device 1016(1)
Alt. Camera Body Extent 1076
Device 1016(N)
Receiving Means 1048(N)
Wireless Comm. Link 1040
Camera Body Control(s) 1004
Camera Body 1008
Alt. Camera Body Extent 1080
Transmitting Means 1036
Controlling Means 1032
Remote Device Controller 1028
Wireless Comm. Link 1040
Device 1020(1)
Alt. Device Extent 1068(1)
Device 1020(N)
Device 1024(1)
Alt. Device Extent 1072(1)
Device 1024(N)
Receiving Means 1052(N)
Non-Modeling Continuous Lighting Devices 1020
In-Scene Non-Lighting Devices 1024
Receiving Means 1052(1)
Alt. Device Extent 1068(N)
Receiving Means 1056(1)
Receiving Means 1056(N)
Alt. Device Extent 1072(N)

FIG. 10

1000

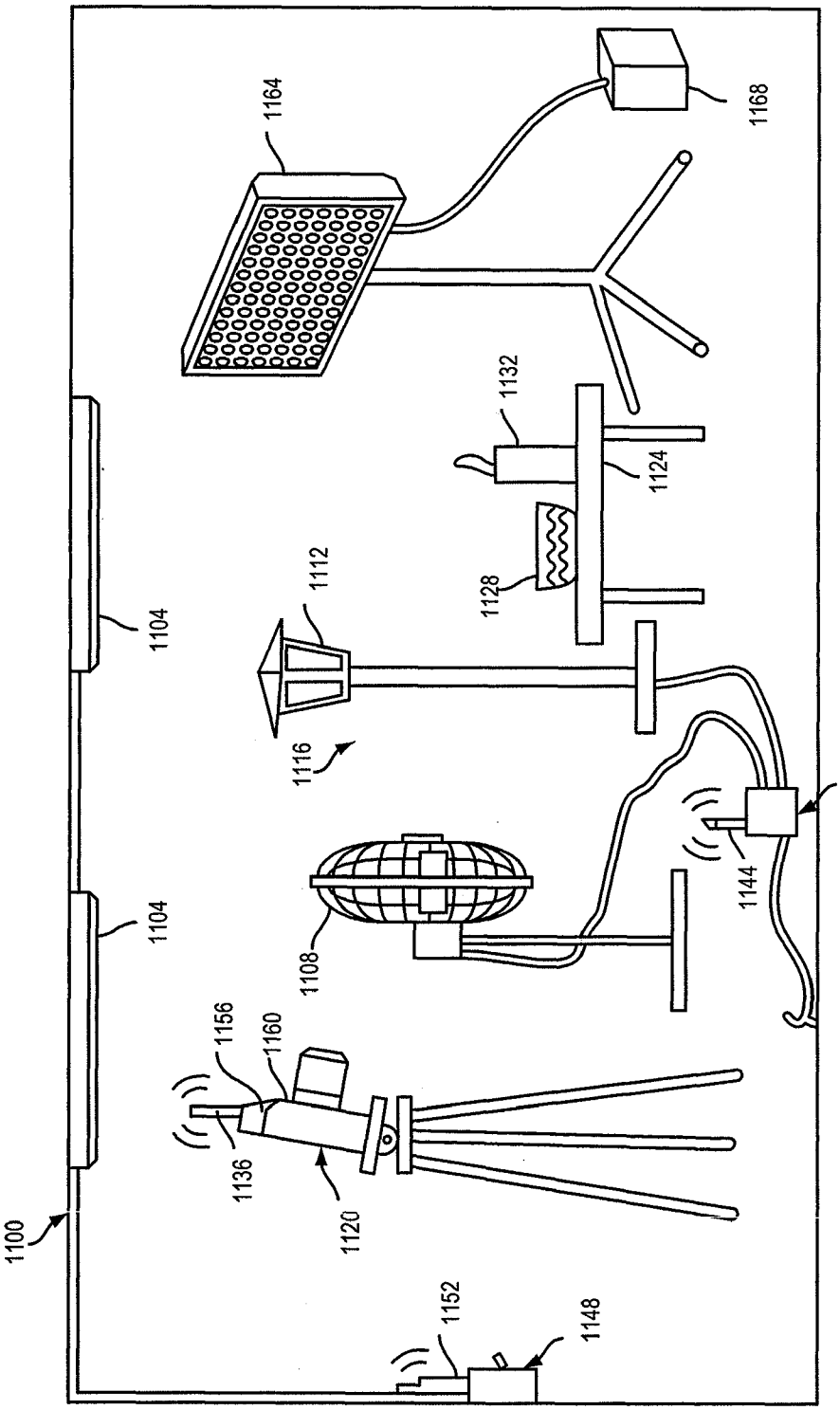
1164
1168
1132
1124
1128
1112
1104
1116
1140
1144
1104
1108
1156
1160
1136
1120
1100
1152
1148

FIG. 11

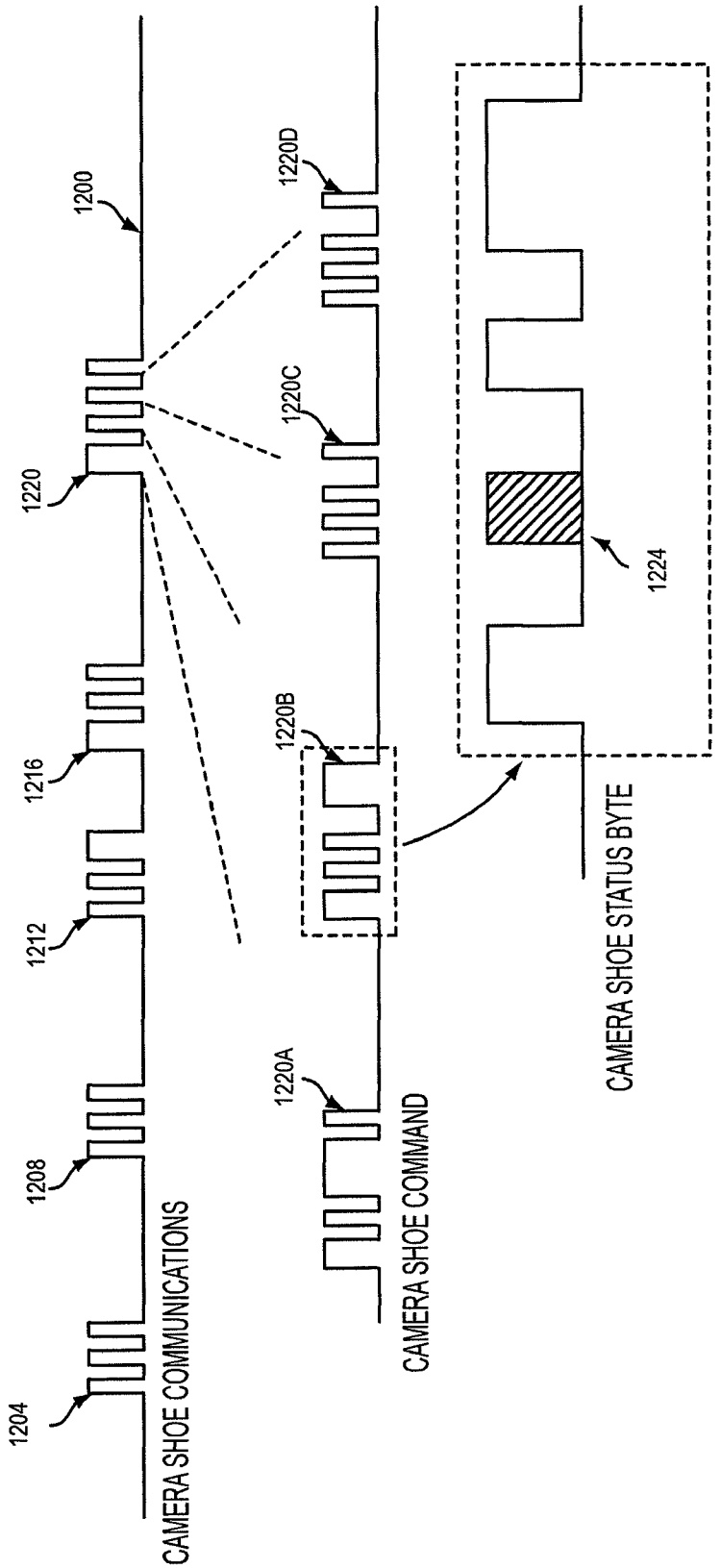
1200
1220D
1220C
1220
1216
1220B
1212
1208
1220A
1204
1224
CAMERA SHOE COMMUNICATIONS
CAMERA SHOE COMMAND
CAMERA SHOE STATUS BYTE

FIG. 12

SYSTEMS AND METHODS FOR COMMUNICATING WITH A DEVICE USING ONE OR MORE CAMERA BODY CONTROLS

RELATED APPLICATION DATA

This application claims the benefit of priority of U.S. Provisional Patent Application No. 61/151,881, filed on Feb. 12, 2009, and titled "Systems And Methods For Communicating With A Device Using One Or More Camera Body Controls," which is incorporated here in by reference in its entirety.

FIELD OF THE INVENTION

The present invention generally relates to the field of photography. In particular, the present invention is directed to systems and methods for communicating with a device using one or more camera body controls.

BACKGROUND

Photography is an integral component of modern society, and photographs pervade our lives. Photographic images appear, for example, in books, magazines, catalogs, journals, newspapers, billboards, posters and scrapbooks and are displayed in homes, art galleries, retail stores, shopping malls, office buildings and many other places. While many photographic images are acquired using only natural ambient light, many other images are acquired using photographic flash lighting. When image-acquisition flash lighting is used, a photographer often uses one or more modeling lights prior to image acquisition for any of a variety of reasons, such as checking for unwanted shadows, glare, reflection, etc. and/or checking for desired shadows and other lighting effects. Generally, these modeling lights are either kept powered up to a sufficient level or turned up to a sufficient level when needed. Keeping the modeling lighting powered up can be problematic due to the heat this type of lighting generates, which can be uncomfortable for live models and detrimental to heat-sensitive still subjects. Occasionally turning up the power of modeling lighting can be inconvenient, even using more recent remotely-controlled modeling lights.

Many photographic images are acquired without adding special effects to the captured scene. However, many other photographic images are acquired using added special effects, such as artificial wind, snow, mist and rain, and/or using contrived scenes that use in-scene props and other items, such as in-scene lighting. Today, many special effects generators, for example, fans, snow shakers, misters and rain systems, are turned off and on electronically using dedicated on/off and/or speed/power control switches. Similarly, in-scene lighting can often be controlled using such dedicated control switches. Typically, a photographer, or more often a photographer's assistant, has the task of controlling the operation of any special effects devices and in-scene lighting for image acquisition.

In addition, some photographic settings, such as very low-light scenes photographed in a photography studio (or other location having controllable ambient lighting), require ambient lighting to be lowered or turned off during image acquisition so that the ambient light does not interfere with image acquisition. Often, this ambient lighting needs to remain on except for short periods at and around the time of image acquisition because the ambient lighting is necessary for the photographer and any assistants to see while moving around the studio and/or readying the scene for image acquisition.

Usually, a photographer or photographer's assistant manually controls the pertinent ambient lighting device(s) using conventional dedicated controls.

SUMMARY OF THE DISCLOSURE

In one implementation, the present disclosure is directed to a method of communicating with a controlled device using a camera body. The method includes: detecting a first preset pattern of actuation by a user of at least one first camera body control on the camera body; generating a first power state change signal in response to the detecting of the first preset pattern of actuation; communicating the first power state change signal so as to cause the controlled device to operate at a first power state; after communicating the first power state change signal, detecting a second preset pattern of actuation by a user of at least one second camera body control on the camera body; generating a second power state change signal in response to the detecting of the second preset pattern of actuation; and communicating the second power state change signal so as to cause the controlled device to operate at a second power state.

In another implementation, the present disclosure is directed to a machine-readable storage medium containing machine-executable instructions for performing a method of communicating with a controlled device using a camera body. The machine-executable instructions include: a first set of machine-executable instructions for implementing detection of a first preset pattern of actuation by a user of at least one first camera body control on the camera body; a second set of machine-executable instructions for generating a first power state change signal in response to the detection of the first preset pattern of actuation; a third set of machine-executable instructions for controlling communication of the first power state change signal so as to cause the controlled device to operate at a first power state; a fourth set of machine-executable instructions for implementing, following the communication of the first power state change signal, detection of a second preset pattern of actuation by a user of at least one second camera body control on the camera body; a fifth set of machine-executable instructions for generating a second power state change signal in response to the detection of the second preset pattern of actuation; and a sixth set of machine-executable instructions for controlling communication of the second power state change signal so as to cause the controlled device to operate at a second power state.

In still another implementation, the present disclosure is directed to a method of communicating with a controlled device using a camera body. The method includes: detecting a first preset pattern of actuation by a user of at least one first camera body control on the camera body; in response to the detecting of the first preset pattern of actuation, changing the camera body functionality of a third camera body control of the camera body to a power adjustment functionality for controlling the controlled device; after the changing of the camera body functionality to the power adjustment functionality, detecting a second preset pattern of actuation by a user of at least one second camera body control on the camera body; and in response to the detecting of the second preset pattern of actuation, changing the power adjustment control functionality of the third camera body control back to the camera body control functionality.

In yet another implementation, the present disclosure is directed to a machine-readable storage medium containing machine-executable instructions for performing a method of communicating with a controlled device using a camera body. The machine-executable instructions include: a first set of

machine-executable instructions for implementing detection of a first preset pattern of actuation by a user of at least one first camera body control on the camera body; a second set of machine-executable instructions for changing the camera body functionality of a third camera body control of the camera body to a power adjustment functionality for controlling the controlled device in response to the detection of the first preset pattern of actuation; a third set of machine-executable instructions for implementing detection of a second preset pattern of actuation by a user of at least one second camera body control on the camera body after the changing of the camera body functionality to the power adjustment functionality; and a fourth set of machine executable instructions for changing the power adjustment control functionality of the third camera body control back to the camera body control functionality in response to the detecting of the second preset pattern of actuation.

BRIEF DESCRIPTION OF THE DRAWINGS

For the purpose of illustrating the invention, the drawings show aspects of one or more embodiments of the invention. However, it should be understood that the present invention is not limited to the precise arrangements and instrumentalities shown in the drawings, wherein:

FIG. **1**A is a flow diagram illustrating a method of communicating with a device using one or more camera body controls;

FIG. **1**B is a flow diagram illustrating another method of communicating with a device using one or more camera body controls;

FIG. **2** is a diagram of a photographic system that includes a camera, a wireless controller, a remote multifunctional lighting system incorporating a modeling lighting source, and a special effects fan, wherein the system is configured to perform steps of the methods of FIG. **1**A and/or FIG. **1**B;

FIG. **3** is a high-level diagram of the wireless controller of FIG. **2**;

FIG. **4** is a diagram illustrating a computer-based environment for configuring a wireless controller, such as the external wireless controller of FIGS. **2** and **3**;

FIGS. **5**A-B together contain a flow diagram illustrating a method of controlling the scene illumination output of modeling lighting using a controller having a wake mode, an autofocus assist mode and a backlight mode, such as the controller of FIGS. **2** and **3**;

FIG. **6** is an example timing diagram illustrating functioning of the autofocus assist mode of a wireless controller, such as the controller of FIGS. **2** and **3**, using the control settings illustrated on the screen of the graphical user interface of FIG. **4**;

FIG. **7** is an example timing diagram illustrating functioning of the wakeup mode of a controller, such as the controller of FIGS. **2** and **3**, using the control settings illustrated on the screen of the graphical user interface of FIG. **4**;

FIG. **8** is a diagram illustrating circuitry and corresponding signaling suitable for use in the camera body interface of a controller, such as the controller of FIGS. **2** and **3**;

FIG. **9** is a flow diagram illustrating another method of using a camera body to control illumination output of modeling lighting;

FIG. **10** is a high-level diagram illustrating a flexible control system for controlling a host of devices, including modeling lighting devices, special effects devices, non-modeling continuous lighting devices and in-scene non-lighting devices, using one or more camera body controls of a camera body;

FIG. **11** is an elevational view of a photography studio containing a photographic system that includes a camera, ambient lighting devices and an in-scene lighting device, wherein the system is configured to allow a photographer to control operation of the ambient lighting devices and in-scene lighting device using the body of the camera; and

FIG. **12** is a diagram illustrating a digital camera-body-status communication signal containing autofocus assist and backlight information that a controller of the present disclosure can use to control one or more modeling lighting device (s).

DETAILED DESCRIPTION

Referring now to the drawings, FIG. **1**A illustrates a method **100** of communicating with a remote device using one or more camera body controls. As will be readily understood by those skilled in the art after reading this entire disclosure, a communication method containing broad concepts disclosed herein, such as method **100**, is useful for a number of purposes, including: allowing a photographer to use modeling lighting to check for unwanted and/or wanted lighting effects and levels that will appear in images captured using flash photography; allowing a photographer to control operation of remote special effects; allowing a photographer to control ambient and in-scene lighting; allowing a photographer to control remotely controllable devices appearing in a photographic scene; and any combination thereof, all without having to remove an eye from the camera's viewfinder or live-view display.

Method **100** typically begins at step **105** by detecting whether or not a user has actuated one or more camera body controls of a camera body in a preset pattern setup to correspond to the user's desire to control one or more controllable devices located remote from the camera body. As used herein and in the appended claims, the term "pattern" is intended to cover multiple actuations of one or more camera body controls, such as three rapid partial presses of a shutter-release button, as well as the simultaneous and/or sequential actuation of two or more controls, such as actuating a backlighting control button while holding down a menu on/off switch, among many other possibilities. In addition, it is noted that as used herein and in the appended claims the term "camera body control" and like terms mean a control that causes a signal to be generated either internally or externally relative to the camera body and that is used to control functionality inherent in the camera body itself, any lens attached thereto and any image-acquisition flash-lighting device attached to the camera body or responsive to a flash-sync signal generated by the camera body. Because the present disclosure is directed to controlling devices starting prior to any image capturing, a shutter-release signal is excluded from being a relevant camera body signal. As those skilled in the art will appreciate, the term "shutter" as used herein and in the appended claims is intended to refer to a mechanical shutter, an electronic shutter and any combination thereof and equivalent thereto.

A camera body signal can be generated by a user actuating any type of switch or other actuator, mechanical, soft or otherwise. A camera body signal can also be generated by circuitry internal to a camera body in response to any one or more of a variety of events, such as a user actuating a switch (e.g., a partial press (a/k/a "half press") of a shutter release button or a press of an autofocus button or a depth-of-field preview button or the actuation of a camera-body mode dial) and camera body circuitry determining a particular function is needed (e.g., a camera processor determining that the lens

needs to be autofocused), among others. Examples of a camera body signal generated internally within the camera body include, but are not limited to, a camera body wake signal, a camera body sleep signal, an autofocus assist signal, a camera body backlighting on/off signal, a menu control signal, a flash compensation signal, a signal from a "click wheel" or other user control, such as a partial-press switch signal generated upon a partial press of a shutter-release button. Examples of a camera body signal generated externally include, but are not limited to, a partial-press switch signal initiated from an external device and communicated to the camera body, for example, via an external communications port on the camera body (e.g., a hotshoe, a proprietary connector port, a motor-drive port, a universal serial bus (USB) port, a "FIREWIRE" (IEEE 1394) port, etc.) and any other camera body signal that can be initiated or generated externally from the camera body. Specific examples are described below in detail to give the reader an understanding of how step **105** can be implemented.

However, those skilled in the art will appreciate that controls provided to a particular camera body and camera body control signals vary to a great extent such that it is impractical to cover all current conventional camera body controls and camera body control signals, and that it is virtually impossible to predict future camera body controls and camera body control signals. That said, those skilled in the art will readily be able to implement the broad concepts of the present disclosure for virtually any one or more camera body controls and/or any one or more camera body signals. The detection of the one or more camera body signals can be performed internally or externally relative to the camera body, for example, by a controller, such as a microprocessor/software systems, hardware controller, a combination of these, or other circuitry. Several examples of internal and external detection are described below in detail.

At step **110** a power state change signal for controlling one or more remote devices is generated in response to the detection of the preset camera body control actuation pattern in step **105**. Like detecting step **105**, generating step **110** can be performed internally or externally relative to the camera body, depending on the configuration of the overall system. For example, if a particular camera body includes an internal controller, generating step **110** can be performed internally. In another example in which a controller is provided externally to a camera body, generation step **110** is performed outside the camera body. As will become apparent from the detailed examples provided below, the first power state change signal can be, for example, a signal recognizable directly by the target, i.e., controlled, device(s) or recognizable by an intermediate device, such as a wireless receiving device that, in turn, generates one or more signals recognizable by the controlled device(s). The relevant signaling depends on the overall configuration of the system. As will also be discussed below, the first power state change signal may be accompanied by and/or contain data, such as one or more power level values and/or a power state change time delay value for a subsequent power change, among others. Examples of such data are described below in the detailed examples.

At step **115** the first power state change signal is communicated to the at least one controlled device so as to cause device(s) to operate at a first power state corresponding to the power state change signal. As alluded to above relative to generating step **110**, the way the controlled device(s) are caused to operate at the first power state depends on the configuration of the overall control system. For example, if a particular controlled device has user-settable power levels settings that can be input wirelessly, then the system can be configured, for example, so that the power state change signal contains a desired power level setting. In another example, if a particular controlled device has user-settable power level settings that can be input only either through an onboard user interface on the device or through a wired port on the device, then the system may include two wireless devices, a first one at the camera body and a second one connected to the wired input port of the controlled device. In one scenario, the first wireless device at the camera body may transmit a simple remote-device trigger signal to the second wireless device at the controlled device. In this case, upon receiving the trigger signal the second wireless device would, for example, send the illumination output level setting. If multiple controlled devices are being controlled at the same time via wireless devices, each of these devices may have a unique identifier that a properly configured system can utilize to implement differing control schemes among the multiple devices. Detailed examples of ways of implementing transmitting step **115** are presented below.

At step **120** it is determined whether or not a user has performed a preset pattern of camera body control actuation. This preset pattern may be the same as the preset pattern described above relative to step **105**, or it may be different, depending on the desire of the designer. Like step **105**, the preset pattern can be detected from camera body signals generated internally or externally relative to the camera body. At step **125** a power state change signal for controlling the one or more remote devices is generated in response to the detection of the preset camera body control actuation pattern in step **120**. Like generating step **110**, generating step **125** can be performed internally or externally relative to the camera body, depending on the configuration of the overall system. At step **130** the first power state change signal is communicated to the at least one controlled device so as to cause device(s) to change to a second power state corresponding to the power state change signal generated at step **125**. The implementation of step **130** may be, for example, the same as the implementation of step **115** described above. Details of method **100** are described in more detail below, especially in connection with FIG. **9**.

FIG. **1**B illustrates another method, method **150**, of communicating with a remote device using one or more camera body controls. As with method **100** of FIG. **1**A, method **150** of FIG. **1**B is useful for a number of purposes, including: allowing a photographer to use modeling lighting to check for unwanted and/or wanted lighting effects and levels that will appear in images captured using flash photography; allowing a photographer to control operation of remote special effects; allowing a photographer to control ambient and in-scene lighting; allowing a photographer to control remotely controllable devices appearing in a photographic scene; and any combination thereof, all without having to remove an eye from the camera's viewfinder or live-view display.

Method **150** typically begins at step **155** by detecting whether or not a user has actuated one or more camera body controls of a camera body in a first preset pattern setup to correspond to the user's desire to control one or more controllable devices located remote from the camera body. Again, the term "pattern" is intended to cover multiple actuations of one or more camera body controls, such as three rapid partial presses of a shutter-release button, as well as the simultaneous and/or sequential actuation of two or more controls, such as actuating a backlighting control button while holding down a menu on/off switch, among many other possibilities. In addition, it is noted that as used herein and in the appended claims the term "camera body control" and like terms mean a control that causes a signal to be generated either internally or externally relative to the camera body and that is used to

control functionality inherent in the camera body itself, any lens attached thereto and any image-acquisition flash-lighting device attached to the camera body or responsive to a sync signal generated by the camera body. Because the present disclosure is directed to controlling devices starting prior to any image capturing, a shutter sync signal and related signals for triggering/controlling strobe lighting devices for image-acquisition lighting are excluded from being a relevant camera body signal. As those skilled in the art will appreciate, the term "shutter" as used herein and in the appended claims is intended to refer to a mechanical shutter, an electronic shutter and any equivalent thereto.

A camera body signal can be generated by a user actuating any type of switch or other actuator, mechanical, soft or otherwise. A camera body signal can also be generated by circuitry internal to a camera body in response to any one or more of a variety of events, such as a user actuating a switch (e.g., a partial press (a/k/a "half press") of a shutter release button or a press of an autofocus button or a depth-of-field preview button or the actuation of a camera-body mode dial) and camera body circuitry determining a particular function is needed (e.g., a camera processor determining that the lens needs to be autofocused), among others. Examples of a camera body signal generated internally within the camera body include, but are not limited to, a camera body wake signal, a camera body sleep signal, an autofocus assist signal, a camera body backlighting on/off signal, a menu control signal, a flash compensation signal, a signal from a "click wheel" or other user control, such as a partial-press switch signal generated upon a partial press of a shutter-release button. Examples of a camera body signal generated externally include, but are not limited to, a partial-press switch signal initiated from an external device and communicated to the camera body, for example, via an external communications port on the camera body (e.g., hotshoe, a proprietary connector port, a USB port, a "FIREWIRE" (IEEE 1394) port, etc.) and any other camera body signal that can be initiated or generated externally from the camera body. Specific examples are described below in detail to give the reader an understanding of how step **105** can be implemented.

However, those skilled in the art will appreciate that controls provided to a particular camera body and camera body control signals vary to a great extent such that it is impractical to cover all current conventional camera body controls and camera body control signals, and that it is virtually impossible to predict future camera body controls and camera body control signals. That said, those skilled in the art will readily be able to implement the broad concepts of the present disclosure for virtually any one or more camera body controls and/or any one or more camera body signals. The detection of the one or more camera body signals can be performed internally or externally relative to the camera body, for example, by a controller, such as a microprocessor/software systems, hardware controller, a combination of these, or other circuitry. Several examples of internal and external detection are described below in detail.

At step **160** and in response to the detection of the preset pattern at step **155**, the functionality of one or more camera body controls is changed from camera body functionality to "controlled device control" functionality. At this point, the camera body can be said to enter into a controlled device mode, as distinct from a camera body control mode in which the camera body control(s) at issue has/have only camera body control functionality, and not any functionality relating to controlling a controlled device. As an example, a scroll wheel on the camera body that is "normally" used to control camera body functionality, such as setting a flash compensation value, can be used as a power state control that controls the power output level, for example, an illumination output level of a controlled lighting device, a motor speed of a controlled device having such a motor (such as a special effects fan).

To provide this control mode functionality, when method **150** has changed the functionality of one or more camera body controls, method **150** proceeds to step **165** at which it detects whether or not a user of the camera body has actuated the one or more camera body controls the functionality of which was changed in step **160**. Again, as a simple example in which a scroll wheel normally used for setting a flash compensation value has been changed at step **160** to have controlled device control functionality, step **165** detects whether or not a user has rotated the scroll wheel. As those skilled in the art will readily appreciate, the manner in which this detection will vary with the control(s) involved. In the example of the scroll wheel, a microprocessor aboard the camera body may, for example, monitor an electrical signal from a rotational position transducer as it may when monitoring for rotational position changes of the scroll wheel in a flash compensation context. Alternatively, other signals relating to the rotational position of the scroll wheel can be used, such as an output of the microprocessor based on the transducer signal mentioned above. Those skilled in the art will readily understand that other manners of detection are possible and that it is impractical, and unnecessary, to describe all such possibilities. It is noted, too, that circuitry external to the camera body at issue could be used to perform the various detection (and/or other) steps of method **150** if the relevant signal(s) are made available outside of the camera body, such as via one or more ports on the camera body.

In response to the detection of user actuation at step **165**, method **150** may proceed to step **170** at which one or more power adjusting signals are generated. For example, if the camera body control(s) having changed functionality provide a simple on/off functionality, only one power adjust signal may be generated at step **170**. In other cases, such as with a continuous rotation of the scroll wheel in the scroll wheel example, more than one power adjust signals can be generated. In a particular embodiment of a scroll wheel, a continuous rotating of the scroll wheel by a user may cause a continual generation of incremental power adjust signals that function to cause the controlled device to incrementally adjust in its power state. For example, if the controlled device is a continuous light lighting source having variable illumination output, a rotating of the scroll wheel in one direction will cause the lighting source to gradually brighten, and a rotating of the scroll when in the opposite direction will cause the lighting source to gradually dim. In the context of a controlled device having a variable speed motor, the same rotations of the scroll wheel will cause the motor to, respectively, gradually speed up and slow down. In concert with the generation of one or more power adjust signals at step **170**, at step **175** the power adjust signal(s) are communicated to the controlled device at issue. This communication may be via any suitable wired or wireless communication mode.

At step **180**, it is determined whether or not the user has actuated one or more camera body controls in a second preset pattern (which may be the same as or different from the first preset pattern at step **155**). If so, this is a signal that the functionality of the one or more camera body controls that changed functionality from camera body functionality to controlled device control functionality at step **160** are to be returned to "normal" camera body functionality. This occurs at step **185**. It is noted that the steps of method **150** may not necessarily all be performed every time. For example, a user

can implement the first preset pattern that is detected at step **155**, but decide not to make any adjustments and promptly proceed to implementing the second preset pattern, which is detected at step **180**. In this example, steps **165**, **170**, **175** are not performed. It is also noted that it is possible to integrate other steps within method **150**. For example, method **100** of FIG. **1**A and method **150** of FIG. **1**B can be integrated with one another so that not only does the detection of the first and second preset patterns of camera body control actuation (FIG. **1**B, steps **155**, **180**) result in the mode of the camera body being changed, but such detection also causes the generation corresponding respective power state change signals (see steps **110**, **125** of FIG. **1**A). Further details of this particular example are described below, for example, in connection with FIG. **9**.

FIG. **2** illustrates an exemplary photographic system **200** that is configured to carry out the steps of method **100** of FIG. **1**A and/or method **150** of FIG. **1**B. Referring to FIG. **2**, and also to FIG. **1**A, photographic system **200** includes a camera body **204** and two continuous type modeling lighting apparatuses, namely, a multifunction lighting system **208**, which includes a continuous modeling light, and a dedicated modeling lighting device **212**. In this example, each modeling lighting apparatus **208**, **212** is controllable from camera body **204** via a controller **216** mounted to a hotshoe **220** on the camera body. As described below in detail, controller **216** is configured to control the modeling lighting functionality of multifunction lighting system **208** in one, the other, or both of a wake mode and an autofocus assist mode, depending on a user's preference, and to control modeling lighting device **212** in a backlight control mode. Briefly, wake mode of controller **216** uses a camera body wake signal and a corresponding camera body sleep signal each generated by camera body **204** to control scene illumination output levels of continuous type modeling lighting of multifunction lighting system **208**. The wake signal may be generated by any of a variety of controls on camera body **204**. However, a very useful control for a photographer to use to initiate the wake signal is a shutter release button **224** on camera body **204**, a partial press (commonly referred to as a "half press") of which causes the camera body to generate a wake signal. The corresponding sleep signal is typically automatically generated by camera body **204**, for example, by an internal microprocessor, after a preset time following release of the shutter release or other control.

Autofocus assist (AFA) mode of controller **216** uses a camera body autofocus assist signal generated by camera body **204** to control scene illumination output levels of the modeling lighting of multifunction lighting system **208**. In this example, camera body **204** is configured to generate an autofocus assist signal in two ways, a first in response to a user pressing an autofocus ("AF") button **228** located on the camera body within ready reach of a photographer's thumb and a second in response to the camera body (via autofocus circuitry (not shown)) determining that a lens **232** attached to the camera body needs to be actuated to bring the scene into focus. The generation of camera body autofocus assist signals in both of these manners is well known in the art such that further description is not necessary herein for those skilled in the art to implement the broad concepts disclosed herein.

In this example, backlight (B/L) mode of controller **216** uses a camera body **204** backlighting control signal generated by camera body to control scene illumination output levels of modeling lighting device **212**. In this case, camera body **204** includes a backlighting control button **236** that a user uses to turn backlighting of one or more displays, such as LCD display panel **240**, on the camera body on and off as desired. It is noted that differing camera body models have differing ways of handling backlighting functionality and signaling. For example, some current camera body models have on-actuators like backlight control button **236**, whereas others have on-switches. In most current camera bodies, each type of actuator is used in conjunction with a built-in timer used to control when the camera body turns the backlighting off. In addition, some current camera body models make the camera body backlighting signaling available at the hotshoe of the camera body, whereas others do not. As will be seen below, camera body **204** of FIG. **2** is of the type that makes camera body backlight signaling available at hotshoe **220**. Camera body **204** is also configured like many conventional camera bodies to make camera body wake (and sleep) and autofocus assist signals available at hotshoe **220**. Further details of wake, AFA and B/L modes of controller are described below in greater detail after a description of multifunction lighting system **208** and modeling lighting device **212**.

In this example, multifunction lighting system **208** includes a dual function lighting head **244** that provides both image acquisition strobe light from a flash source **248** (such as a xenon flash tube) and continuous light from a continuous light source **252** (such as a tungsten bulb). Lighting head **244** is powered by a suitable generator pack **256**. A similar multifunctional lighting system is available from Profoto, Stockholm, Sweden, among other photographic lighting manufacturers. Generator pack **256** includes a built-in wireless communications device **260** and an onboard microprocessor (not shown) responsive to a relatively robust set of user-settable lighting control parameters, including modeling lighting control parameters. Parameters for operating multifunction lighting system **208** that a user is able to set/control using wireless communications device **260** include illumination output level settings. In this example, wireless communications device **260** implements a pair of illumination level change delay setting. The use of these parameters and settings is described below in greater detail.

Wireless communications device **260** is in wireless RF communication with controller **216** so as to receive one or more instructions (sets) for controlling the operation of multifunction lighting system **208**. In this connection, wireless communications device **260** includes an RF receiver (not shown). In other embodiments, wireless communications device **260** may also include an RF transmitter or, alternatively to separate RF receiver and transmitter, an RF transceiver. It is noted that in yet other embodiments, wireless communications may be implemented using another communication technique, such as visible-light communication (e.g., using a strobe attached to controller **216**) and infrared communication, among others.

When an instruction (of instruction set, depending on the communication protocol) containing a power level setting is received by the built-in microprocessor of generator pack **256** (for example via built-in wireless communications device **260**, an external port **264** or a built-in user interface **268**), the onboard microprocessor changes the output illumination level of continuous light source **252** to the setting provided in that instruction (set). If a delay value is not also provided with the instruction (set), continuous light source **252** will stay at the new setting until the microprocessor receives another power state instruction, such as another illumination output setting or a power-off instruction. However, when the onboard microprocessor of generator pack **256** receives an instruction (set) containing first and second power level settings and a delay setting, the built-in microprocessor first changes the illumination output of continuous light source **252** to the first power level setting, holds the illumination

output for the delay setting and then changes the illumination output to the second power level setting. The power level setting may be expressed in any convenient form, such as percentage of maximum output power, absolute input power or absolute output power, among others. The delay setting may also be expressed as any convenient value, such as number of seconds, minutes or other predefined periods.

In this example, modeling lighting device **212** is a standalone modeling lighting device that utilizes a continuous light source (on hidden side of device **212**, but such as a tungsten bulb, a light-emitting diode (LED) or an array (panel) of LEDs) to provide continuous light at a user-selectable illumination output level. Such a modeling lighting device is available from Elinca, Geneva, Switzerland, among other photographic lighting manufacturers. Modeling lighting device **212** includes an onboard controller (not shown) that can be set to any one of various illumination output levels via either of an integrated user interface **270** and a wired communications port **272**. Because modeling lighting device **212** does not have a built-in wireless communications device like generator pack **256**, the modeling lighting device is supplemented with an external RF wireless communications device **276** that is in wired communication with wired communications port **272** of the device. In this example, modeling lighting device **212** is configured to be toggled between two user-preset illumination output levels set by a user via integrated user interface **270** in response to it receiving a certain trigger signal. Consequently, wireless communications device **276** is in wireless RF communication with controller **216** so as to receive first and second IOC signals (which may be the same as one another) that cause wireless communications device **276** to provide each certain toggling trigger signal to modeling lighting device **212**. In this connection, wireless communications device **276** includes an RF receiver (not shown). In other embodiments, wireless communications device **260** may also include an RF transmitter or, alternatively to separate RF receiver and transmitter, an RF transceiver. It is noted that in yet other embodiments, wireless communications may be implemented using another communication technique, such as visible-light communication (e.g., using a strobe attached to controller **216**) and infrared communication, among others.

In this example, wireless RF communications among controller **216**, wireless RF communications device **260** of generator pack **256** and wireless RF communications device **276** of modeling lighting device **212** includes the ability of each of these devices to distinguish signaling meant for it from signaling meant for any other device. This can be accomplished in any of a variety of ways, such as by each device having a unique address and including in each transmission the unique address(es) of the device(s) intended to receive a particular transmission. Further detail of such signaling techniques is beyond the scope of this disclosure and is not needed for those skilled in the art to implement such techniques, since they are known in the art.

As those skilled in the art will readily appreciate, hotshoe **220** has a number of electrical contacts (not shown) for communicating various signals to and/or from an accessory, typically a flash device or strobe-controlling radio, mounted to the hotshoe. In this example, camera body **204** is of a type that outputs a camera body wake/sleep signal(s) via one of the pins, denoted the first pin, and outputs a camera body autofocus assist signal via the same first pin. Also in this example, the camera body wakeup signal is characterized by a first voltage change, here from a low level to an intermediate level, the camera body sleep signal is characterized by a second voltage change, here from the intermediate level to the low level, and camera body autofocus assist signal is identified by a third voltage change, here from the intermediate level to a high level. This example is discussed further below in connection with FIGS. **6** and **7**. Further, in this example the camera body backlight control signal appears on a second pin different from the first pin and is identified by an increase in voltage from a low voltage to a higher voltage that is held high while the backlighting is to be on. It is noted that some current camera bodies, such as EOS-series SLRs/DSLRs available from Canon, Inc., Tokyo, Japan, do not provide backlight signals externally through a hotshoe, whereas other current camera bodies, such as SLRs/DLSRs available from Nikon Corporation, Tokyo, Japan, provide backlight on/off information via a status bit in a digital communications bit cluster, for example to allow the camera-body backlighting control signal to control backlighting on a flash unit mounted to the hotshoe. Other camera bodies can have different backlighting signaling arrangements, such as the one illustrated in FIGS. **6** and **7**.

Another characteristic of this example is that backlight control mode is of a non-delay-type. That is, the camera body backlighting stays on until a user turns it off, here, using backlighting control button **236**. Consequently, when a user activates camera body backlight control button **236** to turn camera body backlighting on, controller **216** is configured to cause a first illumination output change in modeling lighting device **212**, here from off to on. (In this example, the photographer wants modeling lighting device **212** to be on when the backlighting of camera body **204** is on. However, there may be other situations when the photographer might want modeling lighting device **212** to be off when backlighting of camera body **204** is on. These differing options are described in more detail below.) Then, when the user activates backlight control button **236** again to toggle the camera body backlighting off, controller **216** is configured to cause a second illumination output change in modeling lighting device **212**, here from on to off. Further details of this control scheme are provided below.

In the current embodiment, controller **216** is not (though it could be) part of a hotshoe-mountable flash device that is fully compatible with camera body **204** (i.e., is able to use any signaling camera body **204** makes available via hotshoe **220**), although such a flash device (not shown), or other flash or non-flash device, may indeed be mounted on the controller via an auxiliary hotshoe **280** that has the same signals available as the signals available at hotshoe **220**. Nonetheless, in this example, controller **216** is configured to utilize some of the same information that camera body **204** normally provides to a compatible flash device via hotshoe **220**. Often, however, conventional camera bodies do not provide their hotshoes with any signaling, i.e., wake, sleep, autofocus assist, backlighting, etc., if they do not recognize that a compatible device has been engaged with the hotshoe. Consequently, in such cases, wireless controller **216** can be configured with an appropriate system for causing camera body **204** to provide the needed signals. U.S. patent application Ser. No. 12/129,402 filed on May 29, 2008, and titled "System and Method For Maintaining Hot Shoe Communications Between A Camera and A Wireless Device," discloses such systems and is incorporated herein by reference for all of its teachings on these systems.

Referring now to FIG. **3**, and also to FIG. **2**, in this example controller **216** includes, among other things, a microprocessor **300**, a hotshoe connector **304**, a camera body signal interface **308**, memory **312**, an external communications port **316**, an RF transmitter **320** and an antenna **324**. It is emphasized at this point, and will be recognized by those skilled in the art

that the components of this example and their arrangement are presented for the sake of illustration and not limitation. Skilled artisans will understand that given the wide range of technologies available for implementing the overarching functionality disclosed herein, there are many ways of implementing this functionality. For example, while the various parts of controller **216** are shown as components discrete from one another, any two or more of the parts can be integrated onto a single integrated circuit chip, for example, as a system on chip. Similarly, various ones of the differing parts can be integrated with one another. For example, any memory provided may be partially or completely integrated with, for example, the microprocessor.

Further variations include the fact that RF transmitter **320** and corresponding antenna **324** can be replaced by another type of transmitting system, such as an infrared or visible light transmitter. An analog of the latter is a hotshoe mounted strobe device capable of sending data wireless to a remote strobe device using specially timed pulsed emissions from a flash tube. In still further variations, the parts of controller **216** provided to enable its functionality externally relative to a camera body, such as camera body **204** of FIG. **2**, can be eliminated and most of the remaining parts adapted for location inside a camera body, except perhaps for an antenna, strobe, or other wireless signal transmitting device. In the case of putting the functionality of a controller of the present disclosure, such as controller **216**, into a camera body, this can be accomplished by retrofitting an existing camera body or by designing the functionality into a new camera body design prior to production. In the latter case, any microprocessor(s)/circuitry used for the modeling lighting control functionality disclosed herein could be the same microprocessor(s)/circuitry that controls conventional camera functionalities. In yet other variations, any microprocessor/software implementation envisioned herein could be replaced by a purely hardware implementation at the choice of the designer. It is also noted that depending on the nature of the particular controller, the transmitter could be supplemented with a receiver, or both could be replaced by a transceiver without departing from the spirit of the embodiments disclosed and intended to be covered by the appended claims.

Returning now to the illustrative example, microprocessor **300** performs a host of functions including, but not limited to, executing machine-executable instructions **326** (e.g., firmware stored in memory **312**), communicating with camera body interface **308**, controlling/communicating with communications port **316**, controlling/communicating with transmitter **320** and providing wireless controller **216** with its unique functionality. Camera body interface **308** receives signals from a camera body, such as camera body **204** of FIG. **2**, for example via hotshoe **220**, and transforms those signals as needed for use by microprocessor **300**. Signals that camera body interface **308** is configured to transform in this example are a camera body wake/sleep signal, a camera body autofocus assist signal and a camera body backlight signal. An example of circuitry suitable for use in camera body interface **308** when these signals are analog voltage signals is described below in connection with FIG. **8**. It is noted, however, that not all camera systems use analog signals to communicate information such as wake, sleep, autofocus assist, and backlight on/off externally from the camera body. Other camera systems handle such communication digitally, for example, using digitally encoded signals. In such cases, the camera body interface may simply be a data link to the microprocessor. Yet other camera systems may implement a hybrid approach wherein one or more signals are analog and one or more signals are digitally encoded. In the context of a microprocessor-based controller, the camera body interface would be configured to handle both types of signaling.

As alluded to above, memory **312** is used generically in FIG. **3** to denote any and all types of memory in communication with controller **216**, including BIOS memory and RAM, among others, that are, as mentioned above, integrated into microprocessor **300** and/or provided externally to the microprocessor. Memory **312** contains information wireless controller **216** needs to perform its functionality, such as, but not limited to: machine-executable instructions **326** for enabling the functionality of the controller; controller setup data; controlled modeling light device parameter settings (such as illumination output levels and delay values); controlled device instructions (sets); and communications settings, e.g., transmit (and receive) frequencies, device identification codes, etc., among other things. Those skilled in the art will understand all of the various types of information that can/needs to be stored in memory **312** to make controller **216** a device that functions according to the concepts disclosed herein.

Continuing with this illustrative example, external communications port **316** is provided for transferring information to and from controller **216**. This allows a user to custom configure controller **216** and provide any needed operational settings for a particular application of the controller. In the present example, communications port **316** is a USB port. However, any other type of communications port, including a wireless port (e.g., Bluetooth, IEEE 802.11, etc.), can be provided in place of or in addition to USB port **316**. In this connection, FIG. **4** illustrates controller **216** in an information transfer environment **400**. In this example, controller **216** is connected to a suitable programming device, such as laptop computer **404** shown, via a USB cable **408** (since in this example external communications port **316** is a USB port). Laptop computer **404** provides a convenient vehicle for presenting to a user a graphical user interface (GUI) **412** of a software application (not shown, but running on the laptop computer in a conventional manner) designed for interacting with controller **216**. GUI **412** is shown presenting a screen **416** that allows a user to select which mode(s) of device control operation the user desires to enable and also allows a user to set the appropriate parameter(s) for each of the selected modes.

It is noted that the example shown in FIG. **4** is simply that, exemplary. In other implementations the programming of a controller made according to the present disclosure can be accomplished in any one or more of a number of ways. For example, the controller can be provided with a user-interface, such as an LCD screen and one or more buttons or other input devices, a touchscreen, etc. that allow a user to program the controller. In other implementations, control parameter values for the controller can be set with one or more mechanical buttons, switches and/or dials, etc. In yet other implementations, control parameter values can be set wirelessly, for example, using a wireless port as mentioned above. In such a case, the programming device could be a smartphone (e.g., BlackBerry device, iPhone device), PDA, laptop computer, desktop computer, dedicated programming device, etc. Those skilled in the art will understand and appreciate the variety of ways that a controller of the present disclose can be programmed with desired control parameter values, if the controller is not preset with the desired values or is not programmable.

As mentioned above, in the present example, controller **216** is configured to have control functionality based on camera body wake signals ("Wake" mode **420**), camera body autofocus assist signals ("AF Assist" mode **424**) and camera

body backlight controls signals ("Backlight" mode **428**). Correspondingly, GUI **412** provides three primary selection controls (here a common GUI-type checkboxes **432**A-C) corresponding respectively to the three modes **420**, **424**, **428**. As will be seen below, a user can select any one, any two or all three of these modes **420**, **424**, **428**, as desired.

If a user selects checkbox **432**A indicating Wake mode **420**, the wake mode parameter selection input fields **436**A-C become active. In this example, Wake mode selection fields **436**A-C are for inputting three desired values, respectively: 1) a first illumination output level, in this example the illumination output level to which to change the modeling lighting of multifunctional lighting system **208** (FIG. **2**) as a function of controller **216** detecting a camera body wake signal; 2) a second illumination output level, here the illumination output level to which to change the modeling lighting of the multifunctional lighting system from the first illumination output level; and 3) a delay value used to determine when to cause the second illumination output level change. In this example, illumination output levels are expressed as a percentage of the maximum illumination output and the delay value is expressed in seconds.

If a user selects checkbox **432**B indicating AF Assist mode **424**, the autofocus assist parameter selection input fields **440**A-C become active. In this example, autofocus assist mode selection fields **440**A-C are for inputting three desired values, respectively: 1) a first illumination output level, in this example the illumination output level to which to change the modeling lighting of multifunctional lighting system **208** (FIG. **2**) as a function of controller **216** detecting a camera body wake signal; 2) a second illumination output level, here the illumination output level to which to change the modeling lighting of the multifunctional lighting system from the first illumination output level; and 3) a delay value used to determine when to cause the second illumination output level change. In this example, illumination output levels are expressed as a percentage of the maximum illumination output and the delay value is expressed in seconds.

If a user selects checkbox **432**C indicating Backlight mode **428**, a pair of parameter selection checkbox controls **444**A-B become active. In this example, Backlight mode **428** has two sub-modes **448**A-B. In first sub-mode **448**A, the controlled device (here, modeling lighting device **212** (FIG. **2**)) is turned on when a user turns on the camera body backlighting and is turned off when the user turns off the camera body backlighting. In second sub-mode **448**B, the controlled device is turned off when a user turns on the camera body backlighting and is turned on when the user turns off the camera body backlighting. It is noted that in alternative embodiments each of first and second sub-modes **448**A-B may be provided with power level fields similar to the power level fields of Wake and AF Assist modes **420**, **424**. However, in this example, modeling lighting device **212** (FIG. **2**) is either switched on or off, so no power levels need to be set. Rather, the on- and off-signaling from controller **216** to modeling lighting device **212** will be handled properly depending on which sub-mode **448**A-B is selected. That is, if first sub-mode **448**A is selected, the software application running on laptop computer **404** configures controller **216** to send an on-signal to wireless communications device **260** (FIG. **2**) when a user turns on the backlighting of camera body **204** and to send an off signal to that wireless communications device when the user turns off the camera body backlighting. The opposite is true of second sub-mode **448**B. In another alternative in which the power state change is binary, i.e., off-on-off or on-off-on, GUI **412** may be provided with two power level fields (not shown) corresponding to the two changes. These fields may be identical to fields **436**A-B, **440**A-B of, respectively, Wake mode **420** and AF Assist mode **424**. Then, if a user wants off-on-off functionality, the user would input 100% power for the first power level change (corresponding to the off-on transition) and 0% power for the second power level change (corresponding to the on-off transition). Of course, other alternatives are possible.

FIGS. **5**A-B illustrate a flow diagram illustrating one possible method **500** of controlling controller **216** so as to provide the controller with the functionality illustrated via GUI **412** of FIG. **4**. As those skilled in the art will readily appreciate, method **500** can be implemented in software, in analog circuitry and in any combination thereof. At step **505** method **500** begins. Depending on the power state of controller **216**, step **505** may begin when the controller is first powered on and, if the controller has wake and sleep states to control power consumption, every time the controller is woken up. At step **510** the controller determines (or already knows) whether or not AF Assist (AFA) mode **424** is enabled. As discussed above relative to GUI **412** (FIG. **4**), AF Assist mode **424** may be enabled during an appropriate setup procedure, for example, by a user checking checkbox **432**B in the GUI with controller **216** in communication with laptop **404**. If AF Assist mode **424** is not enabled, method **500** continues to step **515** wherein controller **216** checks to determine whether Wake mode **420** has been enabled, for example, in a manner similar to AF Assist mode **424**.

However, if at step **510** controller **216** determines (or knows) that AF Assist mode **424** is enabled, then method **500** proceeds to step **520** at which the controller determines whether or not it has detected an AFA signal generated by camera body **204** (FIG. **2**). If controller **216** has not detected camera body AFA signal, method **500** simply proceeds to step **515** to determine whether Wake mode **420** is enabled. On the other hand, if controller **216** has detected a camera body AFA signal, at step **525** controller **216** generates and transmits an illumination output change signal. In this example, since generator pack **256** (FIG. **2**) of multifunction lighting system **208** has built-in wireless communication device **260** and is responsive to instructions containing illumination level settings, step **525** includes transmitting the first change level set in field **436**A of GUI **412**. In this example, controller **216** transmits the first change level signal as soon as possible after it detects the camera body AFA signal.

At step **530** controller implements the delay set in field **436**C of GUI **412**. In this example, generator pack **256** has an internal timer and is responsive to wirelessly received instructions that include delay values. Consequently, in one example when controller **216** transmits the IOC signal along with the first illumination level at step **525**, at the same time it transmits the set delay value. Those skilled in the art will understand that other implementations can utilize a timer function built into the controller. At step **535**, controller **216** causes the modeling light to change to the second change level set in field **436**B of GUI **412**. In the present example in which generator pack **256** is responsive to a robust instruction set, controller **216** performs step **535** by sending the second change level along with the delay value and first change level that the controller sends at step **525**. Generator pack **256** then implements the change of the modeling light of multifunction lighting system **208** to the second change level after the internal timer of the generator pack times-out on the set delay value. If in another implementation controller **216** provides the timer functionality, the controller could send a second IOC signal containing the second change level in response to the timer timing out. Still further options are possible, depending on the particular capabilities of the modeling light-

ing devices at issue. It is noted that the flow diagram for method **500** does not capture other steps that can be implemented to provide various other operating features that may be needed to provide desired operation. For example, once controller **216** detects a camera body AFA signal at step **520**, it may be desirable to disable Wake mode **420** and/or backlight (B/L) mode **428** to prevent the controller from changing the modeling lighting to an illumination output level unsuitable for assisting autofocusing.

After controller **216** performs step **535**, example method **500** proceeds to step **515** at which the controller determines (or knows) whether or not Wake mode **420** is enabled. If Wake mode **420** is not enabled, method **500** proceeds to step **540** at which controller **216** determines (or knows) Backlight (B/L) mode **428** is enabled. However, if Wake mode **420** is enabled (step **515**), at step **545** controller **216** determines whether or not it detects a camera body wake signal. In this example (as seen further below in connection with FIG. **7**), the camera body wake signal is an analog signal indicated by an intermediate-level rise in a line voltage on the first pin of hotshoe **220** (FIG. **2**). (In this example, a high level rise in that line voltage indicates the presence of an AFA signal (see FIG. **7** and accompanying description.) When this line voltage is at the intermediate-level voltage, the camera body wake signal is said to be present. Correspondingly, a drop in the line voltage from the intermediate-level voltage corresponds to a sleep signal.

If controller **216** detects a camera body wake signal at step **545**, method **500** proceeds to step **550**, which in this example is implemented because the method is set up to continually loop through the various branches of the method. At step **550**, controller **216** determines whether or not it has already sent a first IOC signal based upon an earlier recognition that the camera body wake signal was high (in this example, at the intermediate-level voltage). If controller **216** has not already sent such first IOC signal, method **500** proceeds to step **555**, wherein the controller generates and transmits that first IOC signal. As will be seen below relative to FIG. **7**, in this example, step **555** essentially causes the modeling lighting of multifunction lighting system **208** to change almost instantaneously after the leading edge of the line voltage begins to rise toward the intermediate level. In this example, the sending of the first IOC signal at step **555** includes sending to wireless communications device **260** (FIG. **2**) of generator pack **256** the first change level noted in field **440**A of GUI **412**. After controller **216** sends the first IOC signal at step **555**, method **500** proceeds to step **540** so as to continue the looping. If at step **550** controller **216** determines that the first IOC signal from step **555** was sent previously since the current camera body wake signal became present, method **500** proceeds to step **540** and continues the continual looping.

If at step **545** controller **216** did not detect a wake signal, then method **500** proceeds to step **560** at which the controller detects whether a camera body sleep signal has occurred. If a camera sleep signal has not occurred, method **500** proceeds to step **540** to continue the looping nature of the method. In this example, the user-set delay value present in field **440**C of GUI **412** (FIG. **4**) is implemented relative to the camera body sleep signal. Since wireless communication device **260** includes a built-in timer, when controller **216** detects a camera body sleep signal at step **560** it proceeds to step **565** in which it implements the set delay value from field **440**C. In this example, controller **216** accomplishes step **565** by transmitting to wireless controller a second IOC signal that includes the second change level setting set in field **440**B of GUI **412**, along with a set-timer instruction and the delay value set in field **440**C of GUI **412**. At step **570** controller **216** causes the modeling lighting of multifunction lighting system **208** to change to the second change level set in field **440**B of GUI **412**. Again, controller **216** performs step **570** by way of the transmitting of the set delay value to wireless communications device **260** at the same time as the second change level setting. Generator pack **256** then changes the illumination output level of the modeling lighting to the second change level when the timer in second wireless communications device times out on the delay. In other embodiments, steps **565** and **570** can be handled differently. For example, if controller **216** were to have the timer functionality, step **565** could involve the controller setting the timer, and step **570** could involve the controller transmitting the second change level upon timing out of the timer. Of course, other possibilities exist. It is noted, too, that the delay could be initiated, for example, from the initial wake signal detection rather than the sleep signal detection. After controller has performed steps **565**, **570**, method **500** loops back to step **540**.

In another variation in which wireless communications device **260** at generator pack **256** includes a built-in timer to handle the delay values set in fields **436**C, **440**C of GUI **412**, this communications device may be augmented with additional timer functionality to account for instances where either camera body **204** never generates, in this example, a sleep signal (such as when a user turns the camera body off while it is still awake) or controller **216** never transmits a second IOC signal (such as when a user turns off the controller before detecting a sleep signal and/or transmitting the second IOC) or a receiver failing to receive a second IOC signal, for example, because of interference between the transmitter and receiver. In such a case, wireless communications device **260** can include a second timer that is reset with a delay value (herein called an "inactivity delay value") each time it receives a first IOC signal. This inactivity delay value will typically be stored in wireless communications device **260** and should be a value greater than any reasonably anticipated value for either of the delay values set in fields **436**C, **440**C of GUI **412** (FIG. **4**). In one example, the inactivity delay value is set to 10 minutes, though many other values may be used.

In conjunction with the inactivity delay value, wireless communications device **260** may also be programmed with a inactivity illumination output value setting that the wireless communications device can load into generator pack **256** if the wireless communications device's timer times out on the inactivity delay value, for example, if it never receives a second IOC signal in the normal course of method **500**. Again, this can happen in this example if camera body **204** never generates a sleep signal and/or controller **216** never transmits a second IOC signal, among other events. The inactivity illumination output value setting may be the same as, or different from, either or both of the illumination output value settings in fields **436**B, **440**B of GUI **412**.

At step **540**, if controller **216** detects (or knows) that Backlight (B/L) mode **428** (FIG. **4**) is not enabled, method **500** simply loops back to step **510**. However, if Backlight mode **428** is enabled, at step **575** controller **216** determines whether or not a camera body B/L signal (e.g., either an on or off signal) has occurred. If not, method **500** simply loops back to step **510**. However, if controller **216** detects a camera body B/L signal at step **575**, it proceeds to step **580** to determine whether or not it has already sent a first IOC signal at step **585** to modeling lighting device **212** (FIG. **2**), in this case simply a toggling signal. If controller **216** determines it has not sent the first IOC signal, method **500** proceeds to step **585** and sends that signal. It is noted that if modeling lighting device **212** were so enabled to respond to transmitted first and second

change levels, the transmission of the relevant signaling at step **585** could include such a level value. After controller **216** generates and transmits an IOC signal at step **585**, method **500** loops back to step **510**. If, however, at step **580** controller **216** determines that it has already sent a first IOC signal (e.g., in response to a user turning camera body backlighting on), method **500** proceeds to step **590** at which the controller generates and transmits a second IOC signal (here, simply another toggle signal), for example, in response to the user turning the camera backlighting off. After controller **216** generates and transmits an IOC signal at step **590**, method **500** loops back to step **510**. It is noted that as with additional optional steps of method **500** relating to AF Assist mode **424**, various additional optional steps may be added relative to Wake and Backlight modes **420**, **428**. For example, various disabling steps and/or interrupt steps may be added to disable certain functionality and/or to allow ones of the various modes to interrupt one another. Those skilled in the art will readily understand how to implement the illustrated and other steps using well known programming and/or circuit design techniques.

Referring now to FIGS. **6-8**, and also to FIGS. **2** and **4**, FIGS. **6-8** illustrate example timing diagrams **600**, **700**, **800** for scenarios involving ones of the Wake and AF Assist modes **420**, **424** (FIG. **4**). As mentioned above, these diagrams **600**, **700**, **800** are for a camera body, such as camera body **204** of FIG. **2**, that communicates wake and autofocus assist signals via common hotshoe contacts as analog voltage signals, as opposed to digital data packet signals. That said, as mentioned above those skilled in the art could readily implement the same sort of control scheme in a digital instruction signaling environment that uses digital packet signal analogs to the analog voltage signals. In timing diagrams **600**, **700**, the settings for Wake mode **420** are: first power change level=50%; second power change level=15%; delay=2 seconds, and the settings for AF Assist mode **424** are: first power change level=80%; second power change level=60%; delay=5 seconds. These settings are shown on screen **416** of FIG. **4**.

Referring to FIGS. **2**, **4** and **6**, timing diagram **600** of FIG. **6** is an example in which only AF Assist mode **424** is enabled. In this example, camera body **204** (FIG. **2**) has generated first and second AFA signals **604**, **608** approximately 2 seconds apart from one another. Camera body **204** may generate each AFA signal **604**, **608** in any number of ways, such as in an automatic mode in response to a user performing a half-press on shutter release button **224** of the camera body or in response to the user pressing a dedicated AFA button **228** of the camera body. When wireless controller **216** first detects the leading edge **604**A of first AFA signal **604**, in this example, it generates and transmits a modeling light instruction (set) containing the first power change level, the second power change level and the delay values set, for example, via GUI **412** of FIG. **4**. Once generator pack **256** receives this instruction (set), as represented by modeling light illumination output curve **612** it changes the output level of the modeling light to the first power change level (here, 80%) from whatever level the modeling light was set to prior to receiving the instruction (set) (here, 0%) and starts a delay timer (not shown) internal to the modeling light using the preset delay value (here, 5 seconds).

If controller **216** does not detect another AFA signal in about 5 seconds from detecting first AFA signal **604**, i.e., in about the time of the delay value, the built-in timer of wireless communications device **260** will time-out and this wireless device will initiate via generator pack **256** the second power level change of the modeling light to the preset level (here, 60%). However, in the case illustrated in FIG. **6**, within about 2 seconds of detecting first AFA signal **604**, controller **216** detects second AFA signal **608**, which in this example causes the controller to send the same instruction (set) it sent in response to the detection of the first AFA signal. When wireless communications device **260** receives this second instruction (set), it initiates the first power level change (which is not actually a change since the first power change level had already been set in response to first AFA signal **604**) of the modeling light and re-sets its internal timer to the preset delay value. Since in this example controller **216** does not detect another AFA signal within about 5 seconds (again, the preset delay) of second AFA signal **608**, after the built-in timer of wireless communications device 260 times out, as seen by modeling light illumination output curve **612**, this communications device initiates the second power change and changes the modeling light output level to the second power change level (here, 60%).

Referring now to FIGS. **2**, **4** and **7**, timing diagram **700** of FIG. **7** is an example for a scenario in which both Wake and AF Assist modes **420**, **424** are enabled. In this example, when the controller **216** detects a leading edge **704**A of a wake signal **704**, it generates and transmits a modeling light instruction (set) that contains the first power change level. When wireless communications device **260** receives that instruction (set), as illustrated by modeling light illumination output curve **708**, it changes via generator pack **256** the modeling light output level from whatever level it was previously set to (here 10%) to the first power change level (here, 50%). As seen from timing diagram **700**, while camera body **204** remains awake (and correspondingly, wake signal **704** remains high), the camera body generates first and second AFA signals **712**, **716**, in this example 1.5 seconds apart from one another. When controller **216** detects the leading edge **712**A of first AFA signal **712**, it generates and transmits a modeling light instruction (set) in a manner essentially the same as described above relative to FIG. **6**. This instruction (set) includes the first power change level, the second power change level and the delay for the AF Assist mode (here, respectively, 80%, 60%, 5 seconds). Upon receiving such instruction (set), as seen by modeling light illumination output curve **708**, generator pack **256** changes its modeling light power output to 80% and sets its internal timer to 5 seconds.

Like the example of FIG. **6**, if controller **216** does not detect another AFA signal in about 5 seconds from detecting first AFA signal, i.e., about the time of the AF Assist mode delay value, the built-in timer of wireless communications device **260** will time-out and will cause generator pack **256** to make the second power level change to the preset level (here, 60%). However, in the scenario illustrated in FIG. **7**, within about 1.5 seconds of detecting first AFA signal **712**, controller **216** detects second AFA signal **716**, which in this example causes the controller to send the same instruction (set) it sent in response to the detection of first AFA signal. When wireless communications device **260** receives this second instruction (set), as seen by modeling light illumination output curve **708**, it initiates via generator pack **256** the first modeling light power level change (which is not actually a change since the first power change level had already been set in response to first AFA signal **712**) and re-sets the communications device's timer to the preset delay value. Since in this example controller **216** does not detect another AFA signal within about 5 seconds (again, the preset delay) of second AFA signal **512**, after the built-in timer of wireless communications device 260 times out, as seen by modeling light illumination output curve **508**, the wireless communications device

initiates the second power change and changes the output level of the modeling light to the second power change level (here, 60%).

In this example, after the timer internal to wireless communications device **260** has timed out from second AFA signal **716**, camera body **204** is still awake for a few seconds, as indicated by wake signal **704** still being high. Camera body **204** may remain awake, for example, because a user continues to hold shutter release button **224** at half-press. However, once controller **216** detects the trailing edge **704**B of wakeup signal **704** (i.e., a sleep signal), it generates and transmits to wireless communications device **260** a modeling light instruction (set) containing the wakeup mode second power change level (here, 15%) and the wake mode delay (here, 2 seconds). When wireless communications device **260** receives this instruction (set), it sets its internal delay timer to 2 seconds. When the internal timer times out, as seen by modeling light illumination output curve **708**, wireless communications device **260** causes generator pack **256** to change its modeling light output level from the current level (here, the 60% level from the second power change of AF Assist mode **424**) to the second power change level (here, 15%). As described above, if controller **216** is so enabled, after this last transmission it may enter a sleep mode to save power.

FIG. **8** illustrates example circuitry **804** that may be used in, for example, camera body interface **308** (FIG. **3**) of controller **216** (FIGS. **2** and **3**) to convert "raw" camera body wake and AFA signals **808**, **812** available, in this example, at hotshoe **220** of camera body **204** to signals suitable for use in microprocessor **300** of the controller. In the context of example circuitry **804**, camera body wake and AFA signals **808**, **812** are of the same analog character as the like signals **604**, **608**, **704**, **712**, **716** of FIGS. **6** and **7**, above. More precisely, in this example, wake signal **808** is characterized by a rise in voltage from a low voltage (here, 0V) to a midlevel voltage (here, 1V), and autofocus signal **812** is characterized by a rise in voltage from the midlevel voltage to a high voltage (here, 3.5V).

Circuitry **804** includes an input **816** that carries an input voltage signal **820** that contains wake and AFA signals **808**, **812** when they occur. Input **816** is electrically coupled to inputs of corresponding respective first and second comparators **824**, **828** that each compare input voltage signal **820** to a particular reference voltage on a corresponding reference voltage line **832**, **836**. Here, the reference voltage for first comparator **824** is 0.5V, which allows the first comparator to output a wake-signal-present signal **840** when wake signal **808** is present on input **816**. Similarly, the reference voltage for second comparator **828** is 2V, which allows the second comparator to output an AFA-signal-present signal **844** when AFA signal **812** is present on input **816**. In this example, wake-signal-present and AFA-signal-present signals **840**, **844** are provided as inputs to microprocessor **300** (FIG. **3**). If the I/O voltage regime of microprocessor **300** is 0V to 3.3V, then the wakeup-signal-present and AFA-signal-present signals **840**, **844** output from comparators **824**, **828** are either about 0V or about 3.3V, depending on whether corresponding wake and AFA signals **808**, **812** are present on input voltage signal **820**. Of course, those skilled in the art will readily appreciate that other circuitry may be used.

While the foregoing example is directed to an analog signaling scheme, those skilled in the art would readily be able to implement control concepts of the present disclosure in a digital signaling scheme where a camera body communicates various state and control information internally and/or externally using digitally encoded information. In addition, it is noted that while the foregoing example is directed to a controller located externally relative to a camera body, as mentioned above a controller of the same, like or other control functionality can be built into a camera body. A potential advantage of building a controller implementing broad concepts of the present disclosure into a camera body is that a greater variety of camera body signals would likely be available, since typically only a subset of the signals generated by a camera body are normally available externally to a camera body through various ports on the camera body.

For example and referring to FIG. **9** and also to FIG. **2**, FIG. **9** illustrates a method **900** of using one or more camera body controls, such as shutter-release control (button), menu-on/off button, scroll wheel/selector button (a/k/a "click wheel"), camera body backlighting control, etc., to control power states of a controllable device, such as the modeling lighting functionality of multifunctional lighting system **208** and/or modeling light **212** (FIG. **2**), the special effects devices **1016**, **1108** (FIGS. **10** and **11**), the non-modeling lighting continuous lighting devices **1020**, **1104**, **1112** (FIGS. **10** and **11**) and/or the in-scene non-lighting devices **1024** (FIG. **10**). Relative to example camera body **204**, that camera body includes shutter-release button **224**, a menu-on/off switch **284**, a click wheel **288** and backlighting control switch **236**. As mentioned above, shutter-release button **224** of camera body **204** implements the common partial (half) press feature that activates a partial-press switch (not shown) that results in a partial-press signal within the camera body that can cause the camera body to initiate a variety of functionality, such as wakeup, autofocusing, through-the-lens metering, etc., as will be understood by those skilled in the art. Menu-off/on switch **284** in this example is a button-type switch that results in a menu on/off signal within camera body **204**. The scroll wheel portion of click wheel **288** is a control commonly used on contemporary digital single lens reflex cameras (often in combination with another control) that allows a photographer to efficiently scroll through a list of camera body settings. As one example, a scroll wheel is sometimes used in flash compensation mode to allow a photographer to scroll among flash compensation values. Often (as here), though not always, a scroll wheel is incorporated into a button-type switch that allows a photographer to make a selection by pressing on the control wheel. When a user actuates the scroll wheel of click wheel **288**, a scroll wheel signal is generated internally to camera body **204**. Similarly, when a user actuates the selector button of click wheel **288**, the selector button signal is generated internally to camera body **204**. The microprocessor (not shown) of camera body **204** uses these signals to control the appropriate camera body functionality.

Method **900**, however, can implement any one or more of these and/or other camera body signals to allow a user to control operation of modeling lighting. Method **900** provides such control by interpreting one or more patterns of user-actuation of one or more camera body controls to be instructions for controlling operation of modeling lighting. As used herein and in the appended claims, the term "pattern" is intended to cover multiple actuations of one or more controls, such as three rapid partial presses of a shutter-release button, as well as the simultaneous and/or sequential actuation of two or more controls, such as actuating backlighting control switch **236** while holding down menu on/off switch **284**, among many other possibilities. As will be readily appreciated by those skilled in the art, there are so many possible scenarios of such patterns that it is not practical, or even possible, to list every one. That said, those skilled in the art will understand that whatever pattern(s) is/are selected for implementation, an important overarching concept is that each pattern be so as to minimize the likelihood of the pattern

or any portion thereof inadvertently changing a camera body setting not relating to the control of modeling lighting.

Method **900** begins at step **905**, for example, when the camera body (here, camera body **204**) is powered on. At step **910**, camera body **204** operates as it normally would upon powering up from an off state. At step **915**, a remote device controller monitors control signaling occurring within camera body **204** to determine whether a preset pattern of control actuation has occurred. As mentioned above, a preset pattern can be any of a variety of sequential actuation of any one or more camera body controls or simultaneous actuation of two or more camera body controls, or a combination thereof. For the sake of illustration, a rapid triple partial pressing of shutter-release button **224** (e.g., a user partially presses the shutter-release button three times in uninterrupted sequence within about one second) is used as the preset actuation pattern for toggling a modeling lighting control mode on and off. In other words, when step **915** detects the rapid triple partial press every odd-numbered time following startup at step **905**, i.e., every 1^{st}, 3^{rd}, 5^{th}, 7^{th}, etc. time after startup, the modeling lighting controller enters the modeling lighting control mode. When the modeling lighting controller enters the modeling lighting control mode, it generates and transmits a first IOC signal (or, more generally, a first power state change signal) to one or more modeling lighting and/or other controlled devices, such as multifunctional lighting system **208** and/or modeling lighting device **212** of FIG. **2**. Again, it is noted that method **900** is not limited by this example to controlling modeling lighting devices. Rather, the same and similar concepts can be used to control any of a wide variety of other devices, such as the special effects devices **1016**, **1108** (FIGS. **10** and **11**), the non-modeling lighting continuous lighting devices **1020**, **1104**, **1112** (FIGS. **10** and **11**) and/or the in-scene non-lighting devices **1024** (FIG. **10**).

Depending on the robustness of the wireless control scheme of each device so controlled, in a manner similar to method **500** of FIG. **5** described above, the transmitting of the first power state change signal may or may not be accompanied by a power level setting, such as an illumination output level, that the controlled device is to be changed to upon receiving the first power state change signal. In one example, this "change power level to" value may be input into the remote device controller in a manner similar to the manner illustrated in FIG. **4** relative to controller **216** of FIG. **2**. In another example, the remote device controller implementing the method of FIG. **9** may simply send, effectively, a toggle command to one or more controlled devices that causes each such device to toggle from one power state (e.g., illumination output level) to another, such as from off to on, or vice versa.

It is noted that a remote device controller that implements method **900** may be the same as or similar to controller **216** of FIGS. **2** and **3** or controller **1028** of FIG. **10**. Indeed, an external controller, such as controller **216** itself, could be configured to perform method **900** for a number of camera bodies. Although most, if not all, currently available camera bodies do not make half-press switch signals available through a hotshoe (e.g., hotshoe **220**), many camera bodies make such signaling available via one or more other external ports on the camera body, for example, a USB port or a proprietary port. Often this is done to allow a camera body to be remotely controlled. Consequently, an external controller enabled to perform method **900** could include a connection, such as a wired connection (e.g., wired connection **290** of FIG. **2**), between a camera body port having access to partial-press signaling and itself (e.g., proprietary port **292**). The circuitry aboard such a controller, for example, camera body signal interface **308** and microprocessor **300** (FIG. **3**), could be configured to recognize the preset pattern, such as the rapid triple partial-press mentioned above. In alternative embodiments, like the alternative embodiments mentioned above relative to controller **216** vis-a-vis FIG. **3**, a modeling light controller that implements method **900** or similar method may be located substantially entirely internally to the camera body. For example, the microprocessor(s) and other circuitry and software (e.g., firmware) already present with a particular camera body for providing non-remote-control functionality, can be adapted to provide the functionality embodied in method **900**. Those skilled in the art will readily understand how to implement such a camera-body based scheme.

If the remote device controller does not detect a preset camera body control actuation pattern at step **915**, method **900** simply loops back to step **910** and continues with non-remote-device-control operation. However, if the remote device controller has detected a preset user control pattern at step **915** and transmitted the first power state change signal at step **920**, method **900** may in one embodiment proceed to step **925** wherein camera body **204** resumes its normal non-remote-device-control operation. If method **900** proceeds to step **925**, it may then proceed to step **930** at which the remote device controller monitors the camera body control signal lines to determine whether another preset user control actuation pattern has occurred. In this example, the pattern is another rapid triple partial pressing of shutter-release button **224**, but in other embodiments, the pattern at issue may be different from the pattern at step **915**. If the remote device controller does not detect the pattern at issue at step **930**, method **900** loops back to step **925** and camera body **204** continues in normal non-remote-device-control operation, while the remote device(s) changed in response to step **920** remain so changed.

However, if the remote device controller detects the preset actuation pattern at step **930**, method **900** proceeds to step **935** at which the controller generates and transmits a second power state change signal (e.g., a second IOC signal in the context of modeling lighting control), along with any change-to-power-level setting. In one example, wherein the first power state change signal turned-on a particular remote device, the second power state change signal turns off that device. Method **900** then loops back to step **910** and the camera body, such as camera body **204** (FIG. **2**), **1008** (FIG. **10**), **1120** (FIG. **11**), operates in its normal non-remote-device-control mode while the modeling lighting remains in whatever state it just turned to in response to step **935**.

In the foregoing steps of method **900** just described, the camera body could be considered to not have changed modes of operation at any time, but rather may be considered to simply send appropriate first and second power state change signals in response to the controller detecting the corresponding preset camera body control actuation pattern(s). In an alternative embodiment illustrated by the portion of method **900** in dashed lines, the camera body may be considered to change modes, since the functionality of one of the camera body controls (e.g., click wheel **288**) changes to suit a particular purpose after the modeling lighting controller has transmitted the first power state change signal at step **920**. In one example, the first power state change signal transmitted at step **920** causes modeling lighting to turn on from an off state. Instead of continuing "normal" operation of the camera body at step **925**, method **900** proceeds to step **940** at which the camera body may be said to change its mode of operation to a remote device "control mode."

In one example utilizing click wheel **288** on camera body **204**, this change of mode means that the camera body changes the functionality of the scroll wheel from any of its conven-

tional uses, such as flash-compensation adjustment, to a control for adjusting the illumination output of modeling lighting essentially in real time while the camera body is in the modeling lighting control mode. The same mode of control could also be used, for example, to adjust the speed of a special effects fan, the speed of a snow shaker, the output of a misting device, and the illumination output of in-scene lighting, among many other things. As those skilled in the art will appreciate, utilizing the scroll wheel functionality of click wheel **288** as a power adjustment control can be readily accomplished in camera body control software (firmware) in conjunction with an appropriately configured remote device controller that utilizes the variable signal resulting from a user turning the scroll wheel. For example, as a user turns the scroll wheel of click wheel **288** in one direction, the remote device controller could interpret this action as requiring it to transmit to one or more controlled devices a series of increasing power state changes (e.g., illumination output levels, speed levels, etc.) in a coordinated manner with the turning of the scroll wheel. Conversely, when the user turns the scroll wheel of click wheel **288** in the opposite direction, the remote device controller would interpret this action as requiring it to transmit to the one or more controlled devices a series of decreasing power state changes in a coordinated manner with the turning of the scroll wheel.

This adjustment via click wheel corresponds to step **945** of method **900** at which the remote device controller detects whether or not a power adjustment condition (in the foregoing example, the turning of the scroll wheel portion of click wheel **288**) is occurring. If so, method **900** proceeds to step **950** at which the remote device controller generates and transmits to the one or more controlled devices one or more illumination output adjustment signals. In the context of generator pack **256** of multifunction light system **208** of FIG. **2**, which has a robust set of operating instructions, such an adjustment signal may include a series of transmitted illumination power levels corresponding to the user's movement of the wheel portion of click wheel **288**. If at step **945** the remote device controller does not detect a power adjustment condition, method **900** proceeds to step **930** where the controller determines whether or not a preset actuator pattern is detected. If not, the camera body remains in the remote-device-control mode and method **900** loops back to step **945**. However, if the remote device controller detects the preset camera body control actuation pattern that causes the controller to end the remote device control mode, method **900** proceeds to step **935** and then to step **955**. At step **935**, the remote device controller generates and transmits a second power state change signal that, for example, turns one or more controlled devices off. At step **955**, the remote device controller changes the camera body from the remote device control mode back to the non-remote-device-control mode. Immediately following step **955**, for example, the scroll wheel of click wheel **288** resumes the functionality it had prior to camera body **204** entering controlled device control mode.

To briefly illustrate the usefulness of the full functionality of method **900**, assume modeling lighting is desired to be on only for a few seconds so as to allow a photographer to check for desired and undesired effects that an image-acquisition strobe flash will have in a captured image. Assume further that the photographer is standing at a camera (which is enabled to perform the steps of method **900**, such as with an internal modeling lighting controller and wireless transmitter), the modeling lighting is presently turned off and the photographer does not know what the illumination output level of the modeling lighting will be when it is turned on. Instead of leaving the camera to check the illumination output setting(s) of the modeling lighting and turn the modeling lighting on, while the photographer is still standing at the camera, and even while looking through the camera's viewfinder, the photographer can turn the modeling lighting on, make any needed illumination output adjustments and then turn the modeling lighting off using one or two finger controls that the photographer is already intimately familiar with.

As a specific example, and assuming the camera has a combination click wheel and the remote device controller is responsive to signals therefrom as follows, the photographer could turn the modeling lighting on by rapidly double pressing the click wheel (steps **910**, **915**, **920**). This would also put the camera into a modeling lighting control mode (step **940**). Then, while in this mode, the photographer could adjust the light output of the modeling lighting by turning the click wheel (steps **945**, **950**) and then make the assessment of the lighting effect(s). Once the photographer has finished the lighting assessment, the photographer may then turn the modeling light off and change the camera back to its "normal" operating mode by again rapidly double pressing the click wheel (steps **930**, **935**, **955**). The photographer could then move on to image capturing. As mentioned above, this general process can be used to control and make power output level adjustments to a host of devices.

While FIGS. **2-8** are directed specifically to controlling modeling lighting devices and FIG. **9** was explained largely in the context of modeling lighting, methods incorporating broad concepts disclosed herein, such as methods **100**, **150**, **500** and **99** of FIGS. **1**A-B, **5**A-B and **9**, respectively, can be used to control virtually any type of controllable device. FIG. **10** generally illustrates this concept. FIG. **10** illustrates diagrammatically a flexible system **1000** that allows a photographer to control any one or more of a myriad of devices of any one or more types using one or more camera body controls **1004** located on a camera body **1008**. In this example, devices that are controllable include modeling lighting devices **1012** (**1012**(**1**)-(N)) (which may be similar to modeling lighting apparatuses **208**, **212** of FIG. **2**), special effects devices **1016** (**1016**(**1**)-(N)) (such as a fan, a snow shaker, a misting device, a fogger, a rain maker, a sprayer, etc.), non-modeling continuous lighting devices **1020** (**1020**(**1**)-(N)) (such as ambient lighting (e.g., general studio/room lighting), in-scene lighting (e.g., electric lamps), etc.) and in-scene non-lighting devices **1024** (**1024**(**1**)-(N)) (such as a motorized train set, magnetic actuator, etc.). As those skilled in the art will appreciate, the general steps illustrated in methods **100**, **150** of FIGS. **1**A-B, respectively, can be used to control any one or more of controlled devices **1012**, **1016**, **1020**, **1024** singly or in various combinations with one another, as described in more detail below.

To enable the remote control functionality, system **1000** includes a remote device controller **1028** that issues one or more appropriate power state change signals to one or more of controlled devices **1012**, **1016**, **1020**, **1024**. To accomplish this, remote device controller **1028** includes a controlling means **1032** and a transmitting means **1036**. Controlling means **1032** detects the one or more camera body signals designated for controlling the one or more controlled devices **1012**, **1016**, **1020**, **1024** and, in response thereto, generates the appropriate signal(s) and any corresponding information, such as device identifier(s) for identifying the particular device(s) for receiving the signal(s). Controlling means **1032** can be implemented in any of a variety of ways in a manner similar to controller **216** discussed above relative to FIGS. **2-9**. These ways include: a microprocessor and software (firmware) combination; a microprocessor, software and hard circuitry combination; and hard circuitry alone. Those skilled

in the art will readily understand how to implement any of these ways when confronted with particular camera body signaling and other design parameters. The signals generated by controlling means will have any of a variety of configurations, depending on the robustness of the signaling the relevant ones of controlled devices **1012**, **1016**, **1020**, **1024** are designed to handle. Such signaling ranges, for example, from a simple toggling signal to signals that include power state settings for the first and second power state change, delay settings and device identification codes.

Transmitting means **1036** transmits the signal(s) generated by controlling means **1032** via wireless communications "links" **1040** to corresponding respective ones of controlled devices **1012**(**1**)-(N), **1016**(**1**)-(N), **1020**(**1**)-(N), **1024**(**1**)-(N) via corresponding respective receiving means **1044**(**1**)-(N), **1048**(**1**)-(N), **1052**(**1**)-(N), **1056**(**1**)-(N). Transmitting and receiving means **1036**, **1044**(**1**)-(N), **1048**(**1**)-(N), **1052**(**1**)-(N), **1056**(**1**)-(N) can utilize any suitable communications mode, such as wireless RF communications (in which case wireless communications links **1040** will be wireless RF links), wireless optical (infrared (IR), visible) communications (in which case wireless communications links **1040** will be wireless optical links), etc. In the case of wireless RF communications, transmitting means **1036** may be an RF transmitter or RF transceiver and each receiving means **1044**(**1**)-(N), **1048**(**1**)-(N), **1052**(**1**)-(N), **1056**(**1**)-(N) may be an RF receiver or RF transceiver. In the case of wireless optical communications, transmitting means **1036** may be, for example, an IR transmitter (transceiver) or a visible light transmitter (e.g., flash lighting strobe) (transceiver), and each corresponding receiving means **1044**(**1**)-(N), **1048**(**1**)-(N), **1052**(**1**)-(N), **1056**(**1**)-(N) may be an IR receiver (transceiver) or visible light receiver (transceiver). Those skilled in the art will readily understand how to implement the desired communications mode as needed to suit a particular design.

Each controlled device **1012**(**1**)-(N), **1016**(**1**)-(N), **1020**(**1**)-(N), **1024**(**1**)-(N) shown in FIG. **10** is shown as having a corresponding alternative device extent **1060**(**1**)-(N), **1064**(**1**)-(N), **1068**(**1**)-(N), **1072**(**1**)-(N) to indicate that the corresponding receiving means **1044**(**1**)-(N), **1048**(**1**)-(N), **1052**(**1**)-(N), **1056**(**1**)-(N) can be located essentially internally relative to that controlled device rather than externally ("essentially" being used to indicate that one or more parts of the receiving means, such as antenna, optical sensor, etc., may be located externally). For example, any one of receiving means **1044**(**1**)-(N), **1048**(**1**)-(N), **1052**(**1**)-(N), **1056**(**1**)-(N) may be built into the corresponding controlled device **1012**(**1**)-(N), **1016**(**1**)-(N), **1020**(**1**)-(N), **1024**(**1**)-(N) or may be provided as an aftermarket solution.

Similarly, camera body **1008** is shown as having differing alternative extents **1076**, **1080** to show that remote device controller **1028** and various parts thereof can be located either internally or externally relative to the camera body, depending on the particular design at issue. For example, when camera body **1008** excludes the entirety of remote device controller **1028**, the controller may be a hotshoe mountable device, such as shown with controller **216** of FIGS. **2** and **3**. However, in alternative embodiments, one or both of controlling means **1032** and transmitting means **1036** may be included within camera body **1008**. In an example of the former, controlling means **1032** may be implemented in the onboard microprocessor (not shown) of camera body **1008** and transmitting means **1036** implemented in an external accessory RF transmitter. In an example of the latter, controlling means **1032** may be implemented in the onboard microprocessor (not shown) of camera body **1008** and transmitting means **1036** implemented in an onboard transmitter provided in the camera body, for example, at the time of manufacture.

Regardless of how remote device controller **1028** is configured relative to camera body **1008**, it may readily be configured to perform methods of the present disclosure, such as methods **100**, **150** of FIGS. **1**A-B. For example, remote device controller **1028** may be configured to have the same or similar functionality as described above relative to controller **216** in connection with FIGS. **2**-**9**, including the programmability illustrated relative to FIG. **4** and the signaling and functioning illustrated relative to FIGS. **5**-**9**. In this connection, it is noted that the functionality of controller **216** described above relative to FIGS. **2**-**9** is specific to modeling lighting. However, those skilled in the art will understand that the illumination output levels and control of modeling lighting devices **208**, **212** are readily translatable into power state levels and control of non-modeling lighting devices, such as special effects devices **1016**, non-modeling continuous lighting devices **1020** and in-scene non-lighting devices **1024**.

For example, FIG. **11** illustrates a scenario within a photography studio **1100** in which a remote device controller (not shown, but the same as or similar to remote device controller **1028** of FIG. **10**) is used to control non-modeling lighting devices, specifically, general studio lighting devices **1104**, a special effects fan **1108** and an in-scene lighting device, i.e., a post lamp **1112**. In this example, the remote device controller is configured in a manner similar to controller **216** of FIGS. **2** and **3**, has settings similar to the settings shown in GUI **412** of FIG. **4**, and performs the steps of method **500** of FIGS. **5**A-B at least with respect to Wake mode **420** and Backlight mode **428** (FIG. **4**). In particular and as described below in more detail, Wake mode **420** is used to control both fan **1108** and post lamp **1112**, and Backlight mode **428** is used to control studio lighting devices **1104**.

Studio **1100** contains a scene **1116** to be photographed using a camera body **1120**. In this example, scene **1116** includes post lamp **1112**, a table **1124**, a bowl **1128** and a lit candle **1132** resting on the table. Scene **1116** is to be a very dimly lit scene, with the only light to be present when images are being captured by camera body **1120** during the image-acquisition phase being low levels of light from post light **1112** and from lit candle **1132**. Light levels during image acquisition are to be so low that any ambient lighting other than light from post light **1112** and lit candle **1132** must be extinguished. Also during image capture, fan **1108** is used to create a gentle breeze so as to cause lit candle **1132** to flicker slightly.

In this example, the remote device controller is built into camera body **1120** and includes an RF transmitter (not shown, but evidenced by antenna **1136** on the camera body). As mentioned, both fan **1108** and post light **1112** are being controlled using Wake mode **420** (FIG. **4**). Here, a single power controller **1140**, which includes a built-in RF receiver (not shown, but evidenced by antenna **1144**), is used to control both fan **1108** and post light **1112** by varying the electrical power provided to those devices. Power controller **1140**, in this example, includes a built-in timer (not shown) and is configured to be responsive to wireless signals containing power state change settings and a delay value in a manner similar to the modeling light of multifunctional lighting system **208** of FIG. **8**. Consequently, when the remote device controller detects a wake signal, it generates and transmits a signal that contains 1) the power state for power controller **1140** to change fan **1108** and post light **1112** to upon receipt of the signal, 2) the power state for the power controller to change the fan and post light to when the delay times-out, and 3) the delay value. These correspond to the values set in fields

436A-C of GUI 412 of FIG. 4. Note that in the present case, the values for fields 436A-C are, respectively, 10%, 0% and 20 seconds. That is, the power states of fan 1108 and post light 1112 are very low upon the first power state change and are off after the expiration of the second delay. The 20 second delay gives the photographer about a 20 second window for capturing images.

As mentioned above, studio lighting devices 1104 are controlled using Backlight mode 428 (FIG. 4), and during image capturing it is desired that the studio lighting be turned off. To facilitate this, studio 1100 includes a special switch 1148 that can be toggled on and off under wireless control. Consequently, switch 1148 includes a wireless receiver (not shown, but evidenced by antenna 1152). Referring to FIG. 4, submode 444B of Backlight mode 428 is selected in this example so that when the camera body backlighting is turned on, switch 1148, and hence studio lighting devices 1104, are turned off. Then, when a photographer is ready to acquire one or more images of scene 1116 under low-level lighting conditions, the photographer simply needs to turn the camera backlighting on, for example, using a backlighting control switch 1156 on camera body 1120. The photographer may do this at any desired time, for example, after he/she turns on fan 1108 and post light 1112, which can be accomplished by actuating a partial-press of a shutter-release button 1160 on camera body 1120. As described above, a partial-press typically causes a camera body, such as camera body 1120 to generate a camera body wake signal, which the remote device controller aboard the camera body then uses to perform the process of controlling fan 1108 and post light 1112 via power controller 1140. Those skilled in the art will readily understand that this example is merely illustrative and in no way should be construed as limiting. There are many ways of controlling studio lighting devices 1104, fan 1108, post light 1112 and other devices using the broad concepts disclosed herein.

Studio 1100 of FIG. 11 also includes an LED-array modeling lighting device 1164, which, in this example is powered by a battery pack 1168. Modeling lighting device 1164 can be controlled using any suitable one of the control schemes disclosed herein for controlling remote devices, such as the control schemes described above or devised in the spirit of the specifically disclosed control schemes and the present disclosure. An advantage of implementing such a control scheme in connection with LED-array modeling lighting device 1164, other than the sheer ease, is that the device can be controlled to be turned on and/or adjusted to the appropriate power level substantially only when its light is needed, thereby reducing the power drain on battery pack. When such control schemes are utilized with other modeling lighting devices, and other light devices generally, these control schemes can greatly reduce usage of those devices, thereby extending the time between replacements of burned-out light bulbs. This can result in significant cost savings in replacement bulbs over time.

As mentioned above, remote-device control functionality disclosed herein can be implemented regardless of whether the camera body signal(s) utilized is/are analog signals or digital signals. The examples of FIGS. 6-8, above, are directed to utilizing analog AF assist and backlighting control signals of a corresponding camera body that generates such signals to achieve the described exemplary remote-device control functionality. For the sake of completeness, FIG. 12 illustrates a digital camera-body-status communication signal 1200 that generally includes digital equivalents to the AF assist and backlighting signals discussed above. In this example, when the camera body is awake the camera body continually broadcasts camera-body/flash status and settings information via communication signal 1200 in the form of digital data bursts, here 1204, 1208, 1212, 1216, 1220 that each contain, for example, 12 to 24 bytes of status information, bits of which indicates statuses of various camera-body/flash status and settings. In this example, FIG. 12 shows four bytes 1220A-D of such 12 to 24 bytes of burst 1220, and one of these bytes, i.e., byte 1220B, contains a status bit 1224 of interest. In this example, status bit 1224 is a bit that indicates whether or not the backlight is on, with a high value (1) indicating on and a low value (0) indicating off. Byte 1220B or other byte of any one of the data bursts can also include a status bit indicating that an AF-assist request has been made. The same is true for many other camera-body signals, such as a red-eye-reduction signal, among others. When the camera-body signals being utilized for remote-device control functionality, the corresponding controller, for example, the digital counterpart to controller 216 of FIG. 2, can be configured to monitor communications signal 1200 for the bit(s) of interests, for example, using digital signal monitoring techniques known in the art. Once the controller detects the desired signal(s) it can implement the desired remote-device control functionality, for example, any one or more of the functionalities described herein.

Following is a specific example of method 900 that can be useful especially in a studio setting for turning on and off one or more modeling lighting devices and/or other devices used during a photo-shoot. In this example, the controller (not shown, but which can be virtually identical to controller 216 of FIG. 2 except that it is responsive to camera-body event information carried on a digital status communications signal 1200 of FIG. 12) is configured to detect a camera-body mode event that is available on the hotshoe of the camera body, for example, hotshoe 220 of camera body 204 of FIG. 2, and determine when a user has switched back and forth between a manual mode and an automatic mode five times successively within 5 seconds. In this example, this is the actuation pattern that is "looked for" by the controller at steps 915 and 930 of method 900 of FIG. 9. When the controller has detected this pattern, at the relevant one of steps 920, 935 it generates and transmits to one or more remote devices one or more power state change signals that change the power state of the remote device(s). For example, the controller and remote device(s) may be set up so that at the first detection of the noted pattern at step 915 the controller generates and transmits at step 920 one or more power state change signals that turn-on the remote device(s). This could occur, for example, at the beginning of a photo-shoot when the photographer wants to turn on the remote device(s) after they have been off. Then, at the end of the shoot, the user could create the same noted pattern for detection at step 930. In response to the detection of that pattern, the controller would generate and transmit at step 935 one or more power state change signals to turn off the remote device(s). This can be very useful in that it allows one person to control some or all of the powered device using during a photo-shoot from a single location with minimal effort.

Exemplary embodiments have been disclosed above and illustrated in the accompanying drawings. It will be understood by those skilled in the art that various changes, omissions and additions may be made to that which is specifically disclosed herein without departing from the spirit and scope of the present invention.

What is claimed is:

1. A method of communicating with a controlled device using a camera body, comprising:

detecting a first preset pattern of actuation by a user of at least one first camera body control on the camera body;

in response to said detecting of the first preset pattern of actuation, changing the camera body functionality of a third camera body control to a power adjustment functionality for controlling the controlled device, wherein the third camera body control of the camera body is provided for camera body control functionality;

detecting user actuation of the third camera body control while the third camera body control has the power adjustment control functionality, said detecting of the user actuation of the third camera body control including detecting a rotating of a rotary control;

generating a plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control;

wirelessly transmitting the plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control so as to cause the controlled device to continually change power states in accordance with the power adjustment signal;

after wirelessly transmitting the plurality of power adjustment signals, detecting a second preset pattern of actuation by a user of at least one second camera body control on the camera body; and

in response to said detecting of the second preset pattern of actuation, changing the power adjustment control functionality of the third camera body control back to the camera body control functionality.

2. A method according to claim **1**, wherein said detecting of the first preset pattern includes detecting a first sequential actuation of a particular camera body control on the camera body.

3. A method according to claim **2**, wherein said detecting of the first sequential actuation includes detecting a sequential partial-pressing of a shutter release control.

4. A method according to claim **2**, wherein said detecting of the second preset pattern includes detecting a second sequential actuation of a particular camera body control on the camera body.

5. A method according to claim **4**, wherein said detecting of the first sequential actuation includes detecting a first sequential partial-pressing of a shutter release control and said detecting of the second sequential actuation includes detecting a second sequential partial-pressing of the shutter release button.

6. A method according to claim **1**, wherein the controlled device is a lighting device and said generating of a plurality of power adjustment signals includes generating an illumination output change signal.

7. A method according to claim **6**, wherein the lighting device is a wirelessly remote modeling lighting device.

8. A method according to claim **6**, wherein the lighting device is an in-scene lighting device.

9. A method according to claim **6**, wherein the lighting device is an ambient lighting device.

10. A method according to claim **1**, wherein the controlled device includes a motor and said generating of a plurality of power adjustment signals includes generating a first-motor speed change signal.

11. A machine-readable hardware storage medium containing machine-executable instructions for performing a method of communicating with a controlled device using a camera body, said machine-executable instructions comprising:

a first set of machine-executable instructions for implementing detection of a first preset pattern of actuation by a user of at least one first camera body control on the camera body;

a second set of machine-executable instruction for, in response to said detecting of the first preset pattern of actuation, changing the camera body functionality of a third camera body control to a power adjustment functionality for controlling the controlled device, wherein the third camera body control of the camera body is provided for camera body control functionality;

a third set of machine-executable instructions for detecting user actuation of the third camera body control while the third camera body control has the power adjustment control functionality, said detecting of the user actuation of the third camera body control including detecting a rotating of a rotary control

a fourth set of machine-executable instructions for generating a plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control;

a fifth set of machine-executable instructions for controlling wireless transmission of the plurality of power adjustment signals so as to cause the controlled device to continuously change power states in accordance with the power adjustment signal;

a sixth set of machine-executable instructions for implementing, following the wireless transmission of the plurality of power adjustment signals, detection of a second preset pattern of actuation by a user of at least one second camera body control on the camera body; and

a seventh set of machine-executable instructions for, in response to said detecting of the second preset pattern of actuation, changing the power adjustment control functionality of the third camera body control back to the camera body control functionality.

12. A machine-readable hardware storage medium according to claim **11**, wherein said first set of machine-executable instructions includes machine-executable instructions for implementing detection of a first sequential actuation of a particular camera body control on the camera body.

13. A machine-readable hardware storage medium according to claim **12**, wherein said first set of machine-executable instructions includes machine-executable instructions for implementing detection of a sequential partial-pressing of a shutter release control.

14. A machine-readable hardware storage medium according to claim **12**, wherein said sixth set of machine-executable instructions includes machine-executable instructions for implementing detection of a second sequential actuation of a particular camera body control on the camera body.

15. A machine-readable hardware storage medium according to claim **14**, wherein said first set of machine-executable instructions includes machine-executable instructions for implementing detection of a first sequential partial-pressing of a shutter release control and said sixth set of machine-executable instructions includes machine-executable instructions for implementing detection of a second sequential partial-pressing of the shutter release button.

16. A machine-readable hardware storage medium according to claim **11**, wherein the controlled device is a lighting device and said fourth set of machine-executable instructions includes machine-executable instructions for generating an illumination output change signal.

17. A machine-readable hardware storage medium according to claim **11**, wherein the controlled device includes a

motor and said fourth set of machine-executable instructions includes machine-executable instructions for generating a motor speed change signal.

18. A method of communicating with a controlled device using a camera body, comprising:

detecting a first preset pattern of actuation by a user of at least one first camera body control on the camera body;

in response to said detecting of the first preset pattern of actuation, changing the camera body functionality of a third camera body control of the camera body to a power adjustment functionality for controlling the controlled device;

detecting user actuation of the third camera body control while the third camera body control has the power adjustment control functionality, said detecting user actuation of the third camera body control including detecting a rotating of a rotary control;

generating a plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control;

wirelessly transmitting the plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control so as to cause the controlled device to continually change power states;

after said changing of the camera body functionality to the power adjustment functionality, detecting a second preset pattern of actuation by a user of at least one second camera body control on the camera body; and

in response to said detecting of the second preset pattern of actuation, changing the power adjustment control functionality of the third camera body control back to the camera body control functionality.

19. A method according to claim **18**, wherein the controlled device is a lighting device and said generating of the plurality of power adjustment signals includes generating a first illumination output adjustment signal.

20. A method according to claim **18**, wherein the controlled device includes a motor and said generating of the plurality of power adjustment signals includes generating a first motor speed signal.

21. A method according to claim **18**, wherein said detecting of the first preset pattern includes detecting a first sequential actuation of a particular camera body control on the camera body.

22. A method according to claim **21**, wherein said detecting of the first sequential actuation includes detecting a sequential partial-pressing of a shutter release control.

23. A method according to claim **21**, wherein said detecting of the second preset pattern includes detecting a second sequential actuation of a particular camera body control on the camera body.

24. A method according to claim **23**, wherein said detecting of the first sequential actuation includes detecting a First sequential partial-pressing of a shutter release control and said detecting of the second sequential actuation includes detecting a second sequential partial-pressing of the shutter release button.

25. A machine-readable hardware storage medium containing machine-executable instructions for performing a method of communicating with a controlled device using a camera body, said machine-executable instructions comprising:

a first set of machine-executable instructions for implementing detection of a first preset pattern of actuation by a user of at least one first camera body control on the camera body;

a second set of machine-executable instructions for changing the camera body functionality of a third camera body control of the camera body to a power adjustment functionality for controlling the controlled device in response to the detection of the first preset pattern of actuation;

a third set of machine-executable instructions for detecting user actuation of the third camera body control while the third camera body control has the power adjustment control functionality, said detecting user actuation of the third camera body control including detecting a rotating of a rotary control;

a fourth set of machine-executable instructions for generating a plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control;

a fifth set of machine-executable instructions for controlling the wireless transmission the plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control so as to cause the controlled device to continually change power states;

a sixth set of machine-executable instructions for implementing detection of a second preset pattern of actuation by a user of at least one second camera body control on the camera body after said changing of the camera body functionality to the power adjustment functionality; and

a seventh set of machine executable instructions for changing the power adjustment control functionality of the third camera body control back to the camera body control functionality in response to said detecting of the second preset pattern of actuation.

26. A machine-readable hardware storage medium according to claim **25**, wherein the controlled device is a continuous lighting device and said fourth set of machine-readable instructions includes machine executable instructions for generating a first illumination output adjustment signal.

27. A machine-readable hardware storage medium according to claim **25**, wherein the controlled device includes a motor and said fourth set of machine-readable instructions includes machine executable instructions for generating a first motor speed signal.

28. A machine-readable hardware storage medium according to claim **25**, wherein said first set of machine-executable instructions includes machine-executable instructions for implementing detection of a first sequential actuation of a particular camera body control on the camera body.

29. A machine-readable storage medium according to claim **25**, wherein said first set of machine-executable instructions includes machine-executable instructions for implementing detection of a sequential partial-pressing of a shutter release control.

30. A machine-readable storage medium according to claim **25**, wherein said seventh set of machine-executable instructions includes machine-executable instructions for implementing detection of a second sequential actuation of a particular camera body control on the camera body.

31. A method of communicating with a controlled device using a camera body, comprising:

detecting a first preset pattern of actuation by a user of at least one first camera body control on the camera body, wherein said detecting of the first preset pattern includes detecting a first sequential actuation of a particular camera body control on the camera body, wherein said detecting of the first sequential actuation includes detecting a sequential partial-pressing of a shutter release control;

in response to said detecting of the first preset pattern of actuation, changing the camera body functionality of a

third camera body control of the camera body to a power adjustment functionality for controlling the controlled device;

after said changing of the camera body functionality to the power adjustment functionality, detecting a second preset pattern of actuation by a user of at least one second camera body control on the camera body; and

in response to said detecting of the second preset pattern of actuation, changing the power adjustment control functionality of the third camera body control back to the camera body control functionality.

32. A method according to claim **31**, further comprising while the third camera body control has the power adjustment control functionality:

detecting user actuation of the third camera body control;

generating a power adjustment signal in response to said detecting of user actuation of the third camera body control; and

communicating the power adjustment signal so as to cause the controlled device to operate in accordance with the power adjustment signal.

33. A method according to claim **32**, wherein said detecting of the user actuation of the third camera body control includes detecting a rotating of a rotary control.

34. A method according to claim **33**, further including:

generating a plurality of power adjustment signals in substantial synchronicity with the rotating of a rotary control; and

wireless transmitting the plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control so as to cause the controlled device to continually change power states.

35. A method according to claim **32**, wherein the controlled device is a lighting device and said generating of the power adjustment signal includes generating a first illumination output adjustment signal.

36. A method according to claim **32**, wherein the controlled device includes a motor and said generating of the power adjustment signal includes generating a first motor speed signal.

37. A method according to claim **31**, wherein said detecting of the second preset pattern includes detecting a second sequential actuation of a particular camera body control on the camera body.

38. A method according to claim **37**, wherein said detecting of the second sequential actuation includes detecting a second sequential partial-pressing of the shutter release button.

39. A machine-readable hardware storage medium containing machine-executable instructions for performing a method of communicating with a controlled device using a camera body, said machine-executable instructions comprising:

a first set of machine-executable instructions for detecting a first preset pattern of actuation by a user of at least one first camera body control on the camera body, wherein said detecting of the first preset pattern includes detecting a first sequential actuation of a particular camera body control on the camera body, wherein said detecting of the first sequential actuation includes detecting a sequential partial-pressing of a shutter release control;

a second set of machine-executable instructions for, in response to said detecting of the first preset pattern of actuation, changing the camera body functionality of a third camera body control of the camera body to a power adjustment functionality for controlling the controlled device;

a third set of machine-executable instructions for, after said changing of the camera body functionality to the power adjustment functionality, detecting a second preset pattern of actuation by a user of at least one second camera body control on the camera body; and

a fourth set of machine-executable instructions for in response to said detecting of the second preset pattern of actuation, changing the power adjustment control functionality of the third camera body control back to the camera body control functionality.

40. A machine-readable storage medium according to claim **39**, further comprising:

a fifth set of machine-executable instructions for implementing detection of user actuation of the third camera body control while the third camera body control has the power adjustment control functionality;

a sixth set of machine-executable instructions for generating, while the third camera body control has the power adjustment control functionality, a power adjustment signal in response to said detecting of user actuation of the third camera body control; and

a seventh set of machine-executable instructions for controlling, while the third camera body control has the power adjustment control functionality, communication of the power adjustment signal so as to cause the controlled device to operate in accordance with the power adjustment signal.

41. A machine-readable storage medium according to claim **40**, wherein said fifth set of machine-executable instructions includes machine-executable instructions for implementing detection of a rotating of a rotary control.

42. A machine-readable storage medium according to claim **41**, further including:

an eighth set of machine-executable instructions for generating a plurality of power adjustment signals in substantial synchronicity with the rotating of a rotary control; and

a ninth set of machine-executable instructions for controlling wireless transmission of the plurality of power adjustment signals in substantial synchronicity with the rotating of the rotary control so as to cause the controlled device to continually change power states.

43. A machine-readable storage medium according to claim **40**, wherein the controlled device is a lighting device and said generating of the power adjustment signal includes generating a first illumination output adjustment signal.

44. A machine-readable storage medium according to claim **40**, wherein the controlled device includes a motor and said generating of the power adjustment signal includes generating a first motor speed signal.

45. A machine-readable storage medium according to claim **39**, wherein said fourth set of machine-executable instructions includes instructions for detecting a second sequential actuation of a particular camera body control on the camera body.

46. A machine-readable storage medium according to claim **45**, wherein said fourth set of machine-executable instructions includes instructions for detecting a second sequential partial-pressing of the shutter release button.

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